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CHARLES A. BENNETT, Editor
WILLIAM T. BAWDEN, Managing Editor

ASSISTED BY

WILLIAM E. ROBERTS
ARTHUR D. DEAN
FRANK M. LEAVITT

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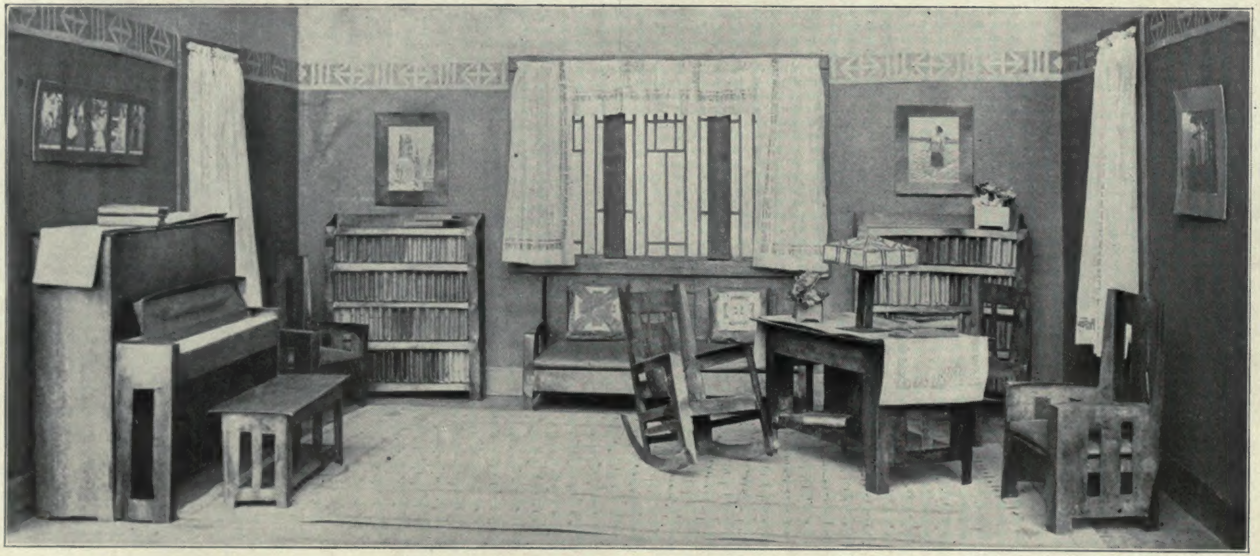

ROOMS IN PAPER—LIVING ROOM.

VOLUME XIII NUMBER 1

MANUAL TRAINING MAGAZINE

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ROOMS IN PAPER.
PROBLEMS IN CONSTRUCTION AND DESIGN.[1]
I.

NAMA A. LATHE AND ESTHER SZOLD.

The illusions are the only things that are valuable and God help the man who reaches the time when he meets only the realities.—Mark Twain.

THE most weighty matters in the world are imponderable thoughts; the strongest forces are the emotions of man. Complete human existence requires dreams, and some form for their realization. Poets, musicians, and artists are granted eminently fitting symbols for the expression of their visions, and may speak directly to the heart from their own emotions. It is indeed a sorry life for which these symbols have no meaning and no comfort. Most of us, however, may only realize our dreams in more physical form. We must sing our songs upon an anvil, write our poems with a pickax, or paint our pictures with a broom. In every human heart, dimly perceived or clearly recognized, is a yearning desire to feel the rhythm, to hear the harmonies, to see the external beauty produced by the daily struggle of life. To the manual arts teachers comes the insistent cry: "Lead us to the fountains of refreshment which spring from the consciousness of the unity of our toil with all the forces which combine to uplift mankind; teach our souls to live as our hands labor."

We have responded willingly, tho at times clumsily. We have striven eagerly to discover the ideal projects and processes as we test each in our psychological sieves. Is this a problem which will give opportunity for self-activity and self-expression? Is the idea one which is involved in the life of all? Is it reasonably within the attainment of all?

Is it an enterprise in which the relation of each part to the whole may be definitely conceived? Does it provide large variety of interest in unity of thought? Do the social as well as the individual aspects of the problem offer to each pupil, not only present exercise, and present satisfaction, but also open to him wide and attractive vistas for future endeavors, and future satisfactions? We aim to elevate a child's sense of beauty; we endeavor to make him capable of producing a beautiful object by his own labor. We touch his present life incidentally and here and there. These things are good, but are they sufficient? Can the child grasp, even unconsciously, the basic relations of his effort to the forces which may worthily shape his entire existence? Or does our work tend to increase the acquisitive commercialism of thought so prevalent and so deadly in our national life?

Character speaks to its environment, not only in words, but also largely and more emphatically, in its material impress upon that environment. In what external form may one's everyday activities adequately express his many-sided individuality and the various phases of his identity? Naturally, we go to the home to become acquainted with the real personality of its members, and there are focused the deepest, most fundamental interests and ambitions of life. May not, therefore, the development of a home be a suitable inspiration for the enterprises and a fitting center for the activities of a lifetime?

DEVELOPMENT OF THE IDEA OF HOME.

But how can such an ideal be realized, such a unified and extensive conception be made concrete in a schoolroom, cumbered with its desks, maps, blackboards and other educational paraphernalia? For the absolute development of this idea—the making of a home—the average schoolroom undoubtedly has serious limitations, nevertheless, within the narrowest limits we have found that much can be done. Taking suggestion from inventors and manufacturers we have made use of the model, planning a home in miniature. Now, let not the wise ones hold up their hands in holy horror when a model is mentioned, saying: "Ah, but the child should live, not merely prepare to live, therefore let him make real things and waste no time on models." That is a great principle, but the conclusion is not inevitable, for education is greater than any one of its principles and tho there are many useless models there are also indispensable models.

We determined upon a scale of ⅛″ to 1″, being the most con-

venient and most typical scale. We have taken large liberties with the materials, in that, for wood, iron, pottery, textiles and all the numerous substances used in a real house we have substituted paper. This has proved a distinct advantage in three ways: first, the pupils have gained a fairly complete knowledge of the possibilities and limitations of this common material, and have acquired a skill in its manipulation; second, much less time has been used than would be necessary to carry out the idea in any adequate fashion in realistic material; third, it has helped to keep the thought that this model represents a desirable home, in the minds of the children and has served to prevent any suggestion of doll-house creeping in.

The doll-house is a familiar and valuable problem in the lower grades, introducing many materials, many processes, and hints of various industries, utilizing the play instinct of the children to develop creative imagination and execution; but the play element, and the restless, flitting, child thought forbid strenuous attention to the decorative and structural possibilities of the problem. As the child grows older, however, and can give careful and sustained attention to an idea, this home-playing instinct does not die, but blossoms into a home-making interest which grows fairer, brighter, and more fruitful with every year of growth. But woe to the misguided upper-grade teacher who attempts to appeal to the youthful prospective home-maker with an infantile objective form. The doll-house will be greeted with scant attention if not with quick scorn by the young young man of the grammar grades. On the contrary, call upon the real home-making instinct and our problem rises to any height, appeals to the most sophisticated youth, and may be adapted to any age.

METHOD OF APPROACH.

While no one room forms a complete home, the vision is usually bounded by the walls of a single room, and it has seemed consistent, sufficient and expedient, in the grades at least, to keep our problem within a like limit. As such, we exercise as many considerations of color, proportion, relations of construction, fitness, and utility as are involved in the plan of a home, for the principles remain the same; only the individual applications differ. We have chosen four typical rooms; a living-room, a dining-room, a bed-room, and a kitchen will be shown, and the problems explained, in this and following articles.

One place for the introduction of this problem is undoubtedly in

the advanced fifth grade, just before, or else hand in hand with, the making of individual objects for the home, provision for which is made in most schools in the shopwork for the boys, and in the domestic science and art for the girls. And in schools where conditions prevent either, this problem will be found very profitable, avoiding the obstacles and making possible excellent manual training for pupils of varying ages, in narrow quarters. It fills a long-felt want in high and normal schools and in collegiate courses in domestic art, as it presents a comprehensive view of the home in a visible and readily altered or re-arranged form.

PAPER FURNITURE.

According to the aims, the problem may be presented to emphasize the design, the introduction to mechanical drawing, or the constructive features. It is exceedingly rich in its possibilities for original design and for study of the best things that have been made by master minds of the present and of the past. The limitations are practically just those of the teacher, as the difficulties of expense, schoolroom insufficiencies and child inabilities are largely eliminated. The satisfactory development of the problem requires no tool other than pencil, ruler, right-angle (triangle) and scissors; no equipment other than the regular school-desk and room. The material is paper, supplemented with glue, stain, and water-color. The setting may be provided by a few hours of carpenter work and a few cent's worth of lumber.

Pedagogs are all agreed that interest is the best lubricator for the educational machinery. The difficulty is to keep a steady flow of this oil upon the bearings, which shall render the necessary practice pleasant and the inevitable drill delightful on the long journey to the goal of

skill and accuracy. We have found no failing of interest, nor even of enthusiasm from the first lesson until the flowers were placed in the vases in the furnished room. And afterward, the room continued the subject of conversation, discussion, and admiration for months.

The home offers the greatest stimulus to esthetic appreciation, and the broadest field for its exercise that one may find. Moreover, the construction of this paper furniture, which utilizes the principles of angle-strength and bracing at points of thrust, gives the same added strength to paper,—a sheet material, that it gives to steel—also a sheet material. All the immense buildings supported by steel framework, all the wonderful steel cranes, ships, and bridges are related to our humble paper furniture. From the photograph of the books on the fern stand one may easily imagine what zest would enter into the making of articles of similar strength. The stand shown is about four and one half inches high and was made of buckskin manila paper, one sheet of which 24″ by 36″ weighs less than four ounces.

STRENGTH TEST OF PAPER FURNITURE.

The development of the furniture from flat paper, with its training of the power to create an image in three dimensions—to see with the mind more than can be seen with the eye, with its demand for exact measurement, for accurate drawing, for skillful handling, together with its consistent conformity to a definite scale, and its excellent constructive features, as well as the artistic evolution of the room as a whole, present problems of high educational value.

RELATION TO OTHER WORK.

Furnishing a room in this way offers possibilties to relate school-life and home-life, to correlate drawing, manual training, and arithmetic, which are at once apparent. It is highly potential also as a nucleus for lessons in language, in hygiene, and in moral training, while even spelling and geography are not totally unrelated to the home. Again it is necessary to remember that a real teacher must be a pedagog and lead the way wherein the children shall go. We shall show here a beautiful path that leads toward the desirable life and will endeavor to present a map and suggestions which will enable the teacher to lead easily over a new way.

Literal reproduction of real objects is nowhere the aim. The processes of design-application in many instances are similar to the processes common in the industrial world. The design upon the wall paper is printed, the pillow decorations are "applique," the designs on vases and plates are painted, the furniture is stained after it is completed; nevertheless, no process unsuited to the material actually used has been attempted. So, patterns upon rugs have been printed or drawn with colored crayons, paints have been used freely, and paper used for models of any sort of substance, limited only by the fact that it must be accepted as paper and not tortured into unsuitable forms in vain attempt to clothe it in the glory of other material. A "real" letter-rack or waste-basket of paper may be more inartistic because inappropriate and unsuitable than a paper model of a piano or a library table. It is interesting to discover how extensive are the possibilities for adequate representation in paper used in entirely legitimate fashion. At first we attempted merely the simpler forms suggestive of mission furniture, but further developments and designs suggest a very wide range in the types which may be studied in this way.

The first presentation of the problem to the pupils should give them as complete a conception of the whole problem, as broad an outlook upon motives for human endeavor as is possible. To this end, the first question asked a class might wisely be, "For what are we all working?" Our precept-filled children will doubtless answer, "To be good," "To learn," and other admirable but abstract virtues. A suggestive "What will you work for after you have finished school?" or "Why does your father work?" will bring responses of the other extreme: "Working for money." "Why do you want money?" will soon lead to the thought of a home and the teacher may develop the idea that part of righteousness

consists in doing honest work, that consideration for others must temper all acquisition, that money and effort may be spent worthily in promoting peace and joy, beginning in the home. Without moralizing one may teach in the natural process of this work the thought that abundance does not mean beauty, nor wealth happiness, that it is the mind and the mental attitude of a man, not the things which he possesses which make him a valuable member of society, but that at least one way in which his inner life is shown is in the things with which he chooses to surround himself. As Ruskin says: "Good taste is essentially a moral quality. Tell me what you like and I will tell you what you are."

DEVELOPMENT OF TASTE.

In the discussion of the home and its requirements many fundamental principles of art may be related to life in a way which even ten year old children may understand. Home should be a place where every member of the family may find opportunity for rest, refreshment and recreation of mind and body; therefore it must be planned for the home-keeper's convenience. No superfluous thing, nothing without purpose, nothing poorly suited to its purpose may be tolerated. It must be planned to facilitate cleanliness, it must be as beautiful as possible that pleasure may be found in its presence. It should offer quiet for rest, cheer for refreshment, and room for recreation. Color harmony and balance of tone, of line and of form, unity, and subordination, have here a real excuse for being.

After a short discussion of the uses and requirements of various rooms in a home one room should be chosen for more specific and detailed consideration, and the making of a model suggested to the class. While the presence of a completed model of a room might possibly defeat its end by inducing too direct a copy, the teacher should show complete models of some pieces of furniture, which will make definite images possible and show the strength of furniture thus made. The yard stick is an indispensable aid and should be used freely by teacher and pupils to establish the relations of the scale, and the proportions of the real objects in the home. Catalogs of furniture or furnishings, pictures of the best of modern and historic styles, pictures of the furniture and homes of different nations should also be freely consulted, discussed and compared as the work progresses.

Experiments in proportion and spacing of parts may be tried here in minutes which would require days to develop in the real size and substance. The beauty possible thru simple lines and unadorned spaces well

related may be shown in convincing manner in three dimensions. One may offer as many opportunities for individual variations thruout as the abilities of the pupils warrant. This opportunity for individual thought and action, for judgment of the good and the bad, for comparison of the results of one's effort with the results of the efforts of others gives one of the greatest values of the problem, but it depends upon the manner of presentation whether one of these model rooms shall be an inspiration to call for more beautiful and useful living, or whether the mechanical effects shall exclude all else and become a dreary drudgery of no real value, and not even a painless time-killer.

In our own schools the room of fifth grade children which worked first on this problem chose the living-room for the subject of its model. The frontispiece shows the room which they furnished. They made the furniture and stained it. They made designs for the wall paper border, and for the backs of the chairs and decided by vote, after discussion, which should be used in their room. The boy whose stamp was chosen for the wall paper modified his design for the curtains and runners. The pupils chose the general color scheme for the room from colored pictures of beautiful rooms. Everything in the room was made by fifth grade children, they tinted, printed, fitted, and hung the wall paper. The wooden frame was supplied by the teacher. The details of the construction of the furniture and processes necessary to the development will be shown later.

The living-room is the room for all the family, here the family may gather to read, to rest, to study, or to entertain their friends, each limited only by the comfort of the others. The use of the room determines its furnishing and its color scheme. Service and comfort for family and friends are the essentials of a good living-room. Straight chairs, easy arm-chairs, rocking-chairs; a comfortably substantial table; book-cases, with a davenport between them under the windows, pictures, books, a reading lamp, flowers, and last, but by no means least, a piano with its bench, were declared desirable in our large living-room. Indeed, in the discussion of the requirements for this room the first piece of furniture the pupils wished to "buy" for their living-room was a piano —a wiser choice than perhaps it seems, for the unconscious childish wisdom knows the truth that the essentials of life are spiritual, and for its social room asks, first for music—the social art, and the art which possibly appeals most directly to the spiritual nature. Is not this the key to successful education—to enter the kingdom of heaven as a little child willing to accept the real realities of life?

(*To be continued.*)

WHAT TO THINK ABOUT WHEN EQUIPPING A FORGE-ROOM.

W. T. Elzinga.

THE board of education of a southern city planned to extend manual training and to include forging in the work of the new high school. An architect was engaged to draw up plans and in due time a splendid building was erected.

When all was ready for the placing of the equipment, however, it was found that the "room" set aside for forging was entirely unsuited for the purpose, being inadequately lighted and not at all provided with storage room for stock, fuel, and work.

In a very fine school in the middle west, the forge-room, located in the basement many feet below street level, is so poorly lighted that both students and teachers hate to go down there to work. This school does not keep a good teacher very long.

In the central high school of another big middle western city, a very dark room under a stairway was equipped in such a manner, that the blowers and motors and several forges were in absolute darkness. No forging was ever done with this outfit.

The writer taught four years in a room where the forges and anvils were placed so close together, that it was impossible for one to cut iron with a hot chisel and sledge hammer, without interfering with his neighbor, nor could welding be done without endangering the eyesight of several others. In many other forge-rooms the atmosphere is laden with dust and gases, due to improper installation of equipment, and students suffer, teachers complain and leave. Many more instances could be cited to show that this equipping of rooms is often an afterthought.

This way of doing things injures more or less the reputation of those in charge, and as long as school boards insist on putting a certain number of forges in a "room" whether that room is suitable and big enough or not, the forge manufacturers, being in business to sell forges, will usually find a way to place them. Instead of planning the building and rooms for the work, the equipment, courses, and work have to be

planned to suit the rooms, resulting often in inferior courses and mediocre instruction, and consequently in great loss to students and taxpayers.

This article has to do with the economics of manual training in that it suggests a method of equipping a forge-room that will be low in first cost, easy to install and maintain, efficient, clean, economical in power and fuel and a source of joy and comfort to teacher and pupils.

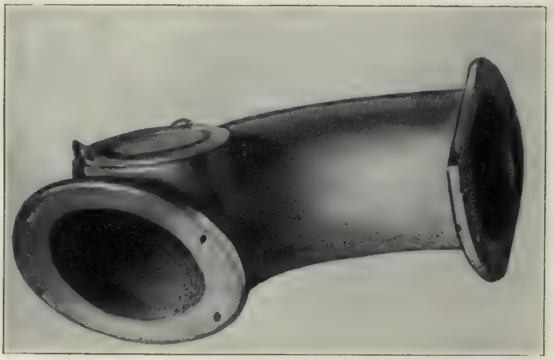


FIG. 1. ELBOW FOR MIXING BLAST.

The scheme outlined is intended for school purposes only; the commercial smith needs more elbow room and can spend his time between heats better in resting and planning, while an electric motor blows his fire. In the commercial shop every man knows his business, the foreman does not have to worry about discipline and demonstrations; noise is no objection; while in the schoolshop the development and comfort of the boy are the first consideration.

There is at this time no need of wasting money and energy on experimental equipments. The past with its many failures and successes will guide all who have to plan for this purpose. Every school erected from now on should be an improvement over others.

THE HAND-BLOWN FORGE.

It may seem odd to think that in this age of power-driven machinery, any one should want to go back to the hand-blown forge, but a careful study of the following arguments and sketches may be the means of saving money, labor, patience, and trouble.

The advantages of a hand-blown, smoke-burning, self-cleaning, forced natural updraft forge are as follows:

The student cannot leave his forge while heating his iron, resulting in better discipline.

While the student is working at the anvil, the blast is shut off; his fire can not burn out as so often happens with the power forge because of leaking valves, thus saving fuel and forge.

The student cannot burn his iron while away from his forge, which means economy of material.

Being employed while heating his iron, the student's mind is naturally on the work all the time, he learns to gage the amount of blast necessary for his fire to a nicety, while with the power forge he often opens the valve too far and thus burns the work and too much coal, or he does not open it enough and consequently wastes his time.

FIG. 2. SELF-CLOSING ASH-GATE.

While turning the blower with the left hand, the student learns to manipulate the fire and tongs with the other hand, taking the awkwardness out of him. This needs all of his attention and trains both head and hands.

The worker naturally takes more interest in the turning of his blower than in a blind lever under his forge, or a dumb belt-driven fan in a dusty corner of the shop.

Usually the student is in the forge-room only forty-five minutes or one hour and a half at a time, and often does no other manual work during the day; there is consequently no danger of the blower tiring him.

When the student stops turning his blower, or when he is absent,

FIG. 3. HAND BLOWN FORGE.

there is no power wasted for a pressure blower; the blast is thus automatically taken care of by the size of the class.

In a smoke-burning down-draft forge nearly all rising gases are drawn thru the fan, mixed with fresh air, see Fig. 1, returned to the

fire, and carried up the stack resulting in economy of fuel, a hotter fire, and purer air in the shop.

The ball-balanced self-closing ash-gate, see Fig. 2 and Fig. 3, will save the student considerable time, which is often lost while blowing with the open gate of some old style forges. In some forges this gate is enclosed and cannot be seen, or if the closing device is worn out and leaky, very little air is delivered to the fire, causing slow heats, oxidization, and bad welds.

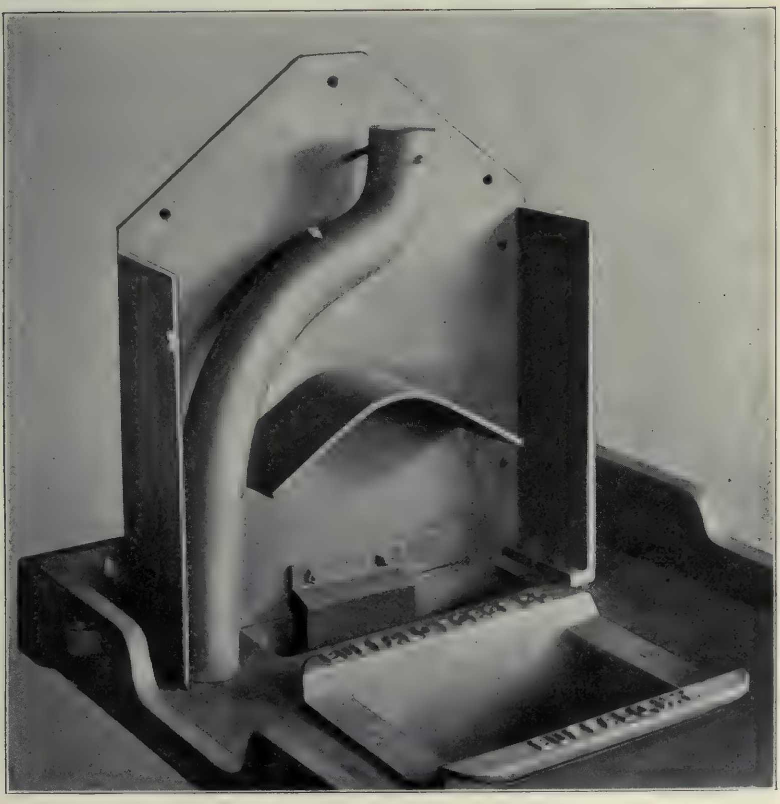


FIG. 4. HOOD OF FORGE, UNCOVERED, AND TUYERE.

When the fire is started, the air valve in the hood, see Fig. 4, can be used to convert the hand blower temporarily into an exhaust fan, so that the first smoke and heat are forced up the stack, heating this stack and creating a natural draft.

A large high speed exhaust fan will thus be unnecessary. A slow speed fan can take its place, causing a saving of power (from 3 to 5 HP.) and many tons of coal in the heating plant of the school. A fact often over-looked is that a large high speed exhaust fan takes not only smoke and gases from the forge-shop, but also draws thousands of cubic

FIG. 5. PART OF HOOD, SHOWING CINDER-CATCHER.

feet of heated pure air from the other parts of the building and blows it out of doors.

The system of hand-blown forges requires less shafting, fewer hangers, pulleys, couplings, clutches, and belts, and will make very little noise. In a school shop the teacher has to talk constantly with his students about the work, and with a dozen anvils ringing, belts and fans humming, the students talking, filing, chipping, etc., it is almost

impossible to make himself understood while giving a demonstration or making suggestions. Hence the desirability of eliminating noise whereever possible.

PRACTICAL SUGGESTIONS.

By using the modern tuyere iron, see Fig. 4, a large amount of good coke may be saved, that is usually wasted when dumping the ashes.

A forge provided with a number of cinder-catchers in the hood, see Fig. 5, will have a cleaner fire, and make possible cleaner welds and work.

By providing cleaner and more comfortable surroundings the students will be induced to take more interest in forging. The main reason why so few boys enter the smith's trade is the dirty and wretched shops in which so many smiths are expected to work. Clean teachers can do much by teaching in a clean shop that smithing is not necessarily a dirty vocation.

The hand-blown forge is much less complicated than the usual power-driven forge, and requires considerably less of the teacher's time for repairs; it has no valves to leak, and no parts to corrode and stick where they cannot be replaced in a very short time.

If the windows in the forge-room are the proper distance apart, the forges can be placed between them, along the walls. The exhaust pipe should be near the ceiling above the windows.

This arrangement leaves an open space in the center for power-hammer, grinder, vise bench, and racks for general tools. The teacher can then see from any part of the room what each student is doing and where help is most needed. A demonstration forge and anvil, with blackboard and seats for students can also be placed to good advantage. The anvils should be set at the proper angle to the forges, so that there will be plenty of elbow room and no danger of students blinding or interfering with each other

Each forge should have a damper in the stack to cut out those not in use.

Where it is not possible to have the forge-room located in a one-story building with a large skylight for lighting and ventilation, the north side of the school building is to be preferred.

The forge-room can never have too much light, the more the better; but it is important not to let the sun shine directly on the anvil or forge, because this makes it next to impossible to judge the proper heat of the iron or steel.

It may be suggested that schools should demand of the anvil manufacturers that hardie holes be made of uniform size and squared with the top surface, so that all anvil tools will be interchangeable.

THE FLOOR OF THE FORGE-ROOM.

By using hand-blown forges, as suggested, everything is kept above ground, and the floor does not have to be torn up at any time. The underground tile of the old down-draft system may keep the floor of

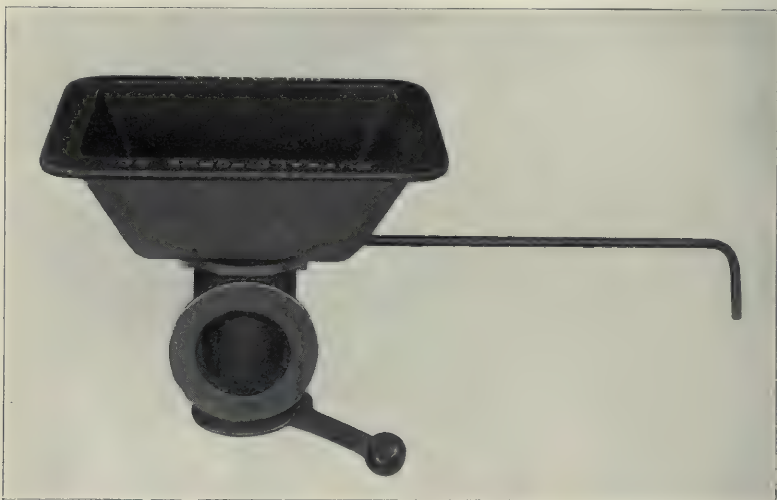


FIG. 6. TUYERE AND ASH-GATE.

the shop a little warmer and for this reason some may prefer this scheme in the colder northern states. A better plan is to provide a wooden floor.

There is nothing better than wood for the forge-room floor, for several reasons: 1. As a rule the smith is better developed physically above the waist line than below, because he works with the upper parts of his body and stands still most of the time, a cold hard floor will reduce his efficiency and lasting power; 2. It will not only save the man, but it will save a good many shoes, because it will indicate the place where a hot chip of iron has fallen, while a flagstone, brick, or concrete floor will not do this; with a piece of 12-gage, 18″ x 12″ sheet iron fastened to the floor next to the anvil base, burning of the floor

will be out of the question; 3. It is easy to keep clean; 4. It will not explode, as sometimes happens with concrete when hot iron is left to cool off in one place; 5. It will save tools and work; 6. The teacher will last longer.

The purpose of this article has been to guide those who are not familiar with the kinks and details of the forge-room,—details that can

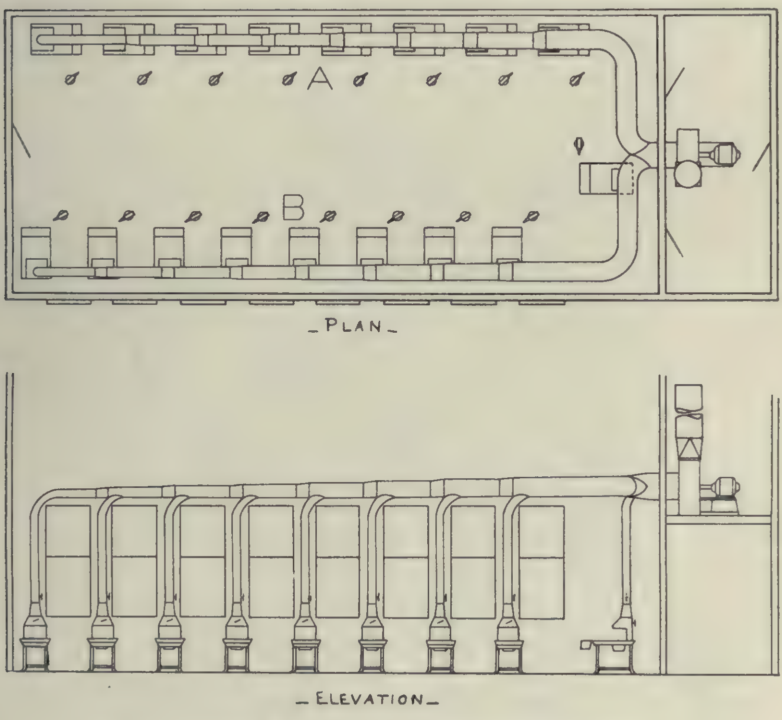


FIG. 7. DIAGRAM SHOWING FLOOR-PLAN AND ELEVATION.

only be learned by years of actual experience. Many forge-rooms are equipped admirably well, but there are others where teachers and students wear themselves out in the attempt to do good work, while laboring under many disadvantages. There is no line of manual training that is more fascinating, and with a good outfit, properly handled, none is more interesting and profitable for boys in the upper grammar grades and high school classes. Would that we could have more of it.

VISITING MANUAL TRAINING SCHOOLS IN EUROPE.
X.—LEIPSIC AND BERLIN.

Charles A. Bennett.

ON the way from Munich to Leipsic I spent a delightful day in wandering about the old city of Nuremberg. I climbed up the hill to the citadel, photographed a dozen towers and picturesque old buildings, and feasted on the charming color effects along the river Pegnitz till long after sundown, but on that day I visited no schools.

In the afternoon of the second day from Munich I reached Leipsic and went almost immediately to the residence of Dr. Alwin Pabst for advice and to make an appointment for a visit to his famous school for the training of teachers of manual training. Dr. Pabst received me as he might have welcomed an old friend, and during the next two days I was with him several times. We talked of the beginnings of manual training work in Leipsic and of the present outlook for manual training in Germany. He spoke of the continued interest and wide influence of Herr von Schenckendorff who helped to organize and for more than twenty-five years has been the president of the German Society for the Promotion of Boys' Handwork; of the pioneer work of Professor Biedermann of Leipsic, whose work Dr. Pabst believes has not yet been fully appreciated; and then of the later work of Dr. Goetze whose viewpoint has long been known to American teachers who have read the translations of his books.

I confess that I was much surprised and disappointed to learn that the Leipsic school for the training of teachers does not continue its sessions thruout the school year. So far as training teachers is concerned all the work is done in a short summer term. During the remainder of the year the building, Fig. 140, is used as a boys' manual training center, yet many of the rooms remain idle. The demand for trained teachers in Germany has not yet reached the point where enough men are willing to make sufficient personal sacrifice in preparation for teaching manual training to warrant the German Society in offering courses covering a full year. The manual training teachers of Germany are school masters who have spent one, two or more summers at the Leipsic training school

or, as in Munich, they are men who have come from the ranks of the artisans. The Leipsic school has always stood for the pedagogic point of view. To meet the Leipsic ideal, a manual training instructor must first be a trained teacher and then a workman, but preëminently a teacher. On this account nearly all of the students at the Leipsic summer

FIG. 140. NORMAL SCHOOL FOR TEACHERS OF MANUAL TRAINING, LEIPSIC.

school are experienced teachers. But while insisting that the boys in their handwork be taught by pedagogically trained instructors the Leipsic school has stood also for good technique and therefore has in most cases employed expert artisans to give instruction to the teachers. In this way, it is believed the best results for the children are obtained.

Having learned of the short duration of the courses in the school, I could easily understand its organization and equipment. As I went thru the rooms I was much interested in what I saw, but I could not get over the feeling of deep regret that the courses were not available thruout the entire year. In the "old museum" were models illustrating in part the history of the courses of study in the school. Models from a few other

schools were also shown. In the "new museum" were exhibited the present courses at Leipsic, the course at Munich and a course formerly taught at Nääs, Sweden. Among the Leipsic courses I noticed (a) cardboard work, (b) woodworking, (c) metalwork, (d) glasswork, (e) apparatus construction, and (f) primary school handwork.

The equipment of the room for cardboard work consisted of plain tables long enough to accommodate six pupils on a side. Each pupil was provided with a block of hard wood to cut on, a straight-edge, a square, and a bone folder; he was expected to furnish his own knife. The room for glassworking contained two long tables with drop gas pipes over their centers. Eight or ten pupils only worked in this room at one time. The woodworking room was fitted up with heavy, single benches of the German cabinet-makers' type, with two vises. By putting a board under the two horizontal bars or braces beneath the bench a tray was formed which was used to hold work. The tools were kept in cases on the sides of the room. There was no exhibit of wood specimens in this room like those in many other shops visited. The explanation of this was that the time for shopwork was so limited that all of it was spent on the handwork. At least, not enough attention was given to instruction in materials to make a collection of woods of much value. In the metal-working room the benches were arranged around the walls. There was no forge in the room. For modeling and wood-carving there were plain tables with holes thru the tops of some of them for the clamps used to hold the pieces of wood while carving. A linoleum top was placed on each modeling table to keep the wood top from warping and to facilitate cleaning. A room for teaching primary handwork was equipped with plain tables, stools, and shelves for finished work. The most unique equipment was the room for rural school manual training. Here were rural school desks, and upon these were bench tops which were used to take the place of the usual benches of the woodworking shop. Here were also horses for holding work while using the drawknife. There was no room in the building devoted especially to drawing, the drawing all being done in the lecture room equipped with long tables and chairs or in one of the workshops. Thruout the building the equipment was extremely simple and inexpensive, tho in most cases very durable. I was interested to learn that the lot of ground at one end of the building was used in teaching gardening.

A feature of this building was the decorative use of sculpture to symbolize education thru handwork, and to honor the men who have

Tafel IV.

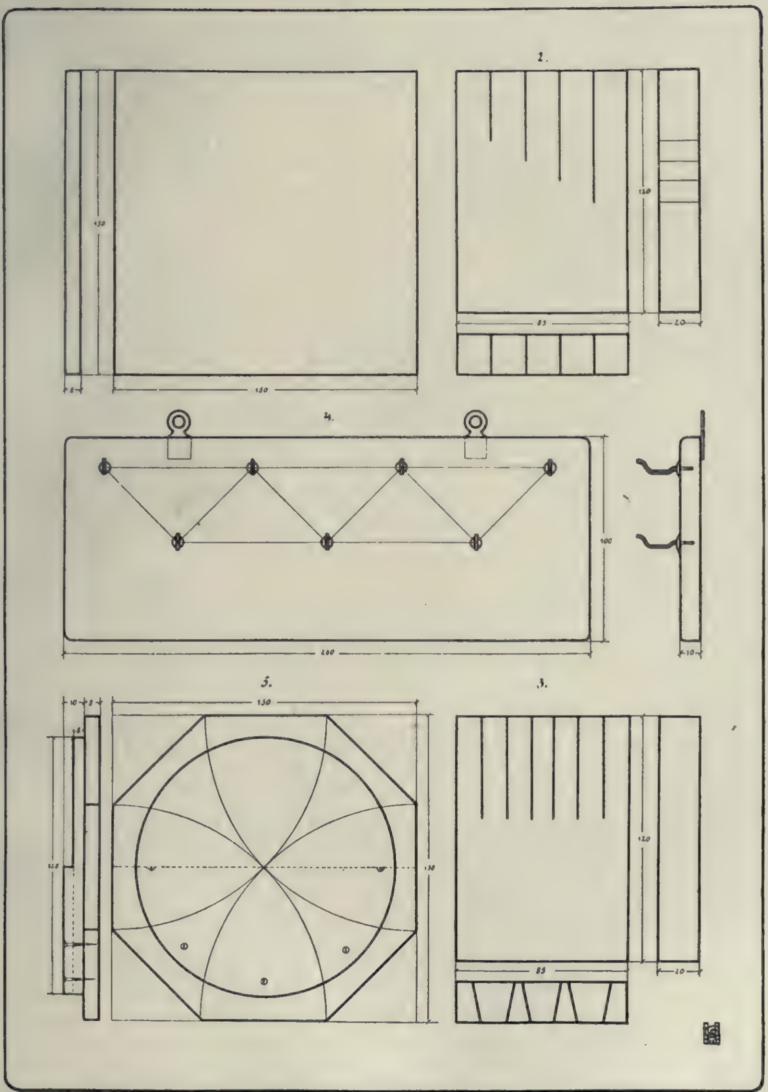


FIG. 141. FIRST FIVE EXERCISES IN NEW COURSE AT LEIPSIC.

made the school a great center of influence. In Dr. Pabst's office was a bas relief of Professor Biedermann, and in the lecture room a bust of Herr von Schenckendorff and a bas relief of Dr. Goetze. In the office there were also two large medallions representing boys at work—one in the act of planing. Similar medallions were placed at the foot of the main stairway, and between these, over the main entrance, was painted in decorative German style:

Bilde das Auge, übe die Hand!
Fest wird der Wille, scharf der Verstand![1]

I was especially interested in the work in modeling. This has been given much attention by Dr. Pabst who is a firm believer in its value. Among the forms modeled in this course were (a) leaf-stem and its joining to the stalk, much enlarged, (b) shells, also much enlarged, (c) a lobster, (d) seed-pods, enlarged to perhaps six times their natural size, (e) a beetle, much enlarged, (f) flowers. The course begins with simple fruit forms—apple, lemon, and the like, and seems to end in naturalistic design, involving leaves, branches and flowers. In general it may be said that in this course there is no effort to adapt the forms to tile-making or pottery, or terra cotta, the emphasis of the course being placed on a serious study of natural forms.

During the past few years many changes have been made in the Leipsic course in woodworking. A new course was in blueprint form when I visited the school. Since that time it has appeared in very attractive book form under the title *Lehrgang fur die Hobelbankarbeit.* Figs. 141 and 142 are reproduced from two of the plates in this book. The second plate indicates—and it is true thruout the course—that far more refinement of design than formerly has been given to the models.

There was no opportunity to study the methods of teaching employed in this school, but I learned that no drawings were used in teaching cardboard work, all the pupils working directly from models. In the woodworking, however, blueprints of working drawings of the models were given out for the pupils to work from.

TECHNICAL SCHOOLS IN LEIPSIC.

While in Leipsic I visited two technical schools, one for girls and another for boys. In the girls' school I was especially interested in the needlework course. This began at the end of the *Volksschule* and continued for three years, after which there was a normal course of one and

[1]Train the eye, exercise the hand,
Strong becomes the will, clear the understanding.

Tafel XIV.

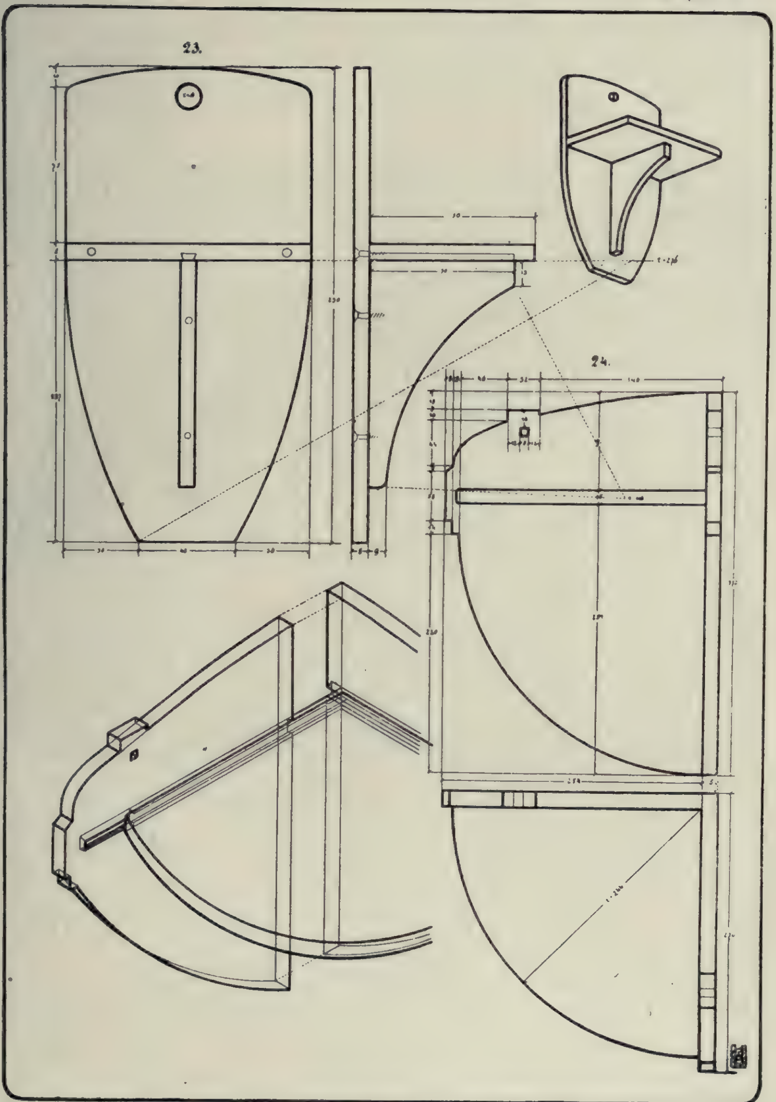


FIG. 142. TWO MODELS IN THE NEW COURSE AT LEIPSIC.

one-half years, for those who wished to become teachers of needlework. During the three first years the girls took sewing and dressmaking or other handwork for twelve hours a week. In the normal course twenty-six hours a week were given to needlework and seven hours to language, mathematics, pedagogy, etc. Is it any wonder that the teachers coming from that school are expert needleworkers? I found two American girls at work there, but unfortunately they were not preparing to become teachers.

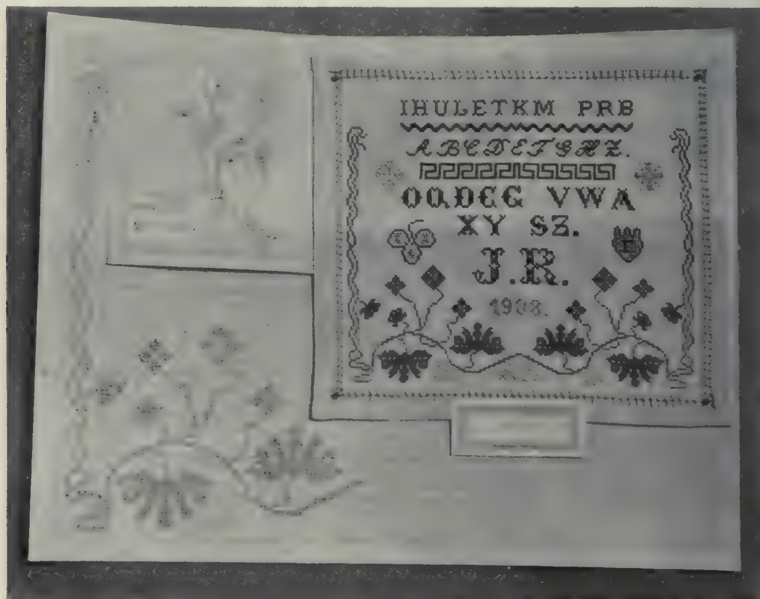


FIG. 143. NATURAL FORMS APPLIED IN NEEDLEWORK.

The course of instruction included considerable work in drawing and design. The teacher in charge of the needlework department considered it of great importance that the drawing be combined with the needlework. The steps in the design work were as follows: (1) Make outline drawing from nature, Fig. 143. (2) Make color drawing from nature. (3) Make design for needlework, adapting the flower studied from nature. The design was first drawn quite small and then full size on cross-section paper, Fig. 143.

I was interested in the fact that the system of models was just changing from samplers to useful pieces. Every exercise was being em-

bodied in a useful article. Even the sample stitches were being worked into the decoration of an apron which had tucks in the lower part and a hem at the bottom. The technique in this school was excellent.

At the boys' technical school I saw large rooms fitted up for advanced work in cabinet-making, wood-carving, clay modeling, machine construction, drawing, and several other kinds of handwork. The excellence of the equipment, the system and quality of the work being done all impressed me favorably. The time spent in this school was too brief, but sufficiently long to notice the superior quality of inlaying that was being done with American woods, and the originality being put into the designs for wood-turning, Fig. 144, wood-carving, Fig. 145, and furniture. I learned, too, that the coloring of wood thru and thru—not merely staining it—was a feature of their woodworking course, and that this was done under heavy steam pressure. There was a room in the basement for this purpose which contained two large hollow cylinders with heads removable like engine cylinder heads. The wood used in the balusters shown in Fig. 144 was gray maple, beautifully colored in one of these large cylinders.

MANUAL TRAINING IN BERLIN.

From Leipsic I went to Berlin. At the suggestion of Dr. Pabst I made a special effort to see the manual training work being done by R. Frenkel. I was fortunate in seeing two of his classes, one in a public school and one in a private elementary school. In the public school I saw a class of upper grammar grade boys in benchwork. They were following a course similar to the one that has since been put into book form, *Die Hobelbankarbeit in Verbindung mit dem Linearzeichnen,* by R. Frenkel. The course seemed to me to be one of the best of the many attempts to unify benchwork and mechanical drawing, instead of running the two subjects in parallel courses and allowing correlation whereever convenient or possible. In every unification scheme for drawing and woodworking that I have ever seen—including the ones I used to make myself—there have been points in the course where one kind of work has been sacrificed to the other. If the teacher is an especially good draftsman the drawing side of the course is usually the best; if his strength is especially in the woodworking it follows as a matter of course that the drawing suffers in the selection of problems to be worked out. Herr Frenkel's course is not entirely free from such sacrifices, but it is well worth a careful study.

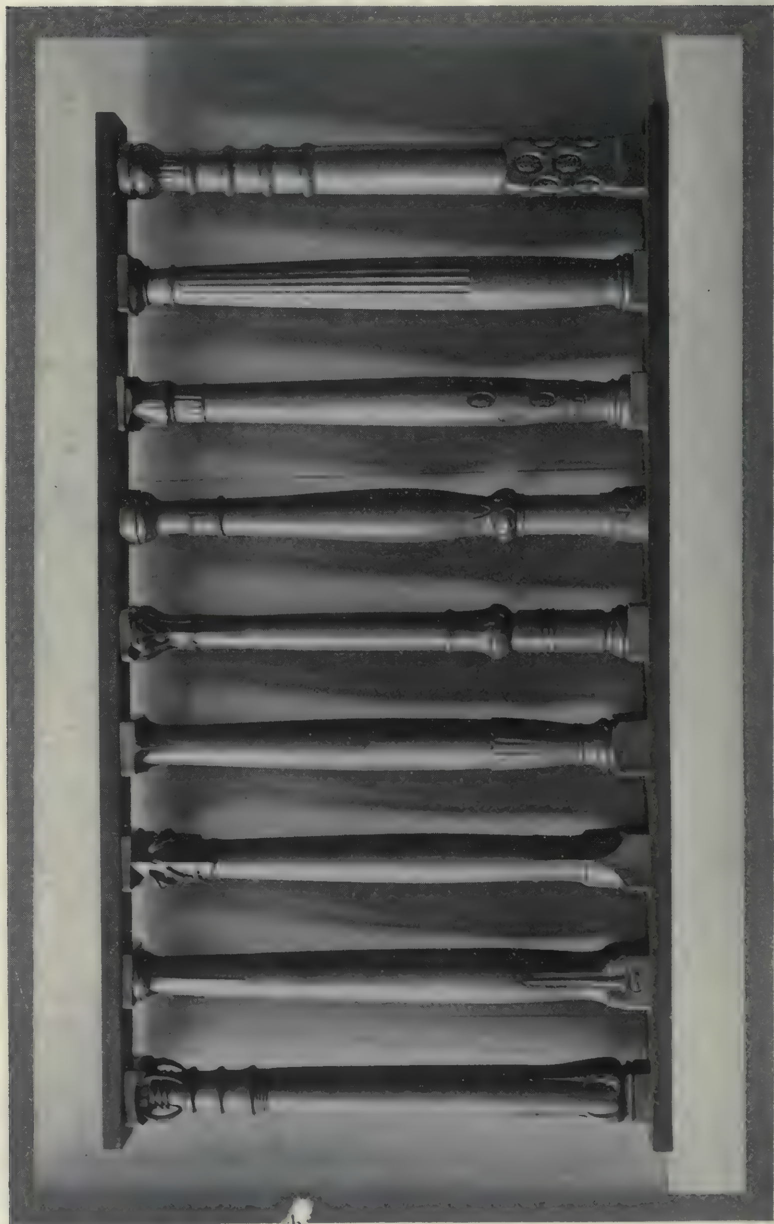


FIG. 144. TURNED AND CARVED FROM GRAY MAPLE.

FIG. 145. TYPICAL EXAMPLES OF DESIGN AND WOOD-CARVING.

I learned that only five of the three hundred *Volksschulen* in Berlin were provided with equipment for manual training, and that only about one-twentieth of the boys who are eligible take the work in manual training, tho five different lines of work are offered—light woodwork, cardboard work, chip carving, benchwork in wood, and clay modeling. One reason for this small attendance was found in the fact that a fee is charged for instruction. Herr Frenkel was fully aware of the conservatism of his city with reference to manual training and wished me to regard the five years during which the work in manual training had been taught as experimental years, and merely a beginning.

At the private school I saw a fifth or sixth grade class in light woodwork and drawing. The general character of the equipment is shown in Fig. 146. The bench-tops were placed on the school desks and the pupils stood in the aisles while at work. Some of the desks were left uncovered for the use of pupils who were at work in drawing. The plane was often used on its side as in a shooting-board, and the European clamps, which have some points of superiority over our hand-screws, for young pupils, at least, were used freely in holding work to the bench-top. The course of instruction was that shown in Frenkel's *Die leichte Holzarbeit in Verbindung mit dem Linearzeichnen.* Like his later work, it is an effort to unify woodworking and mechanical drawing and is especially interesting to study in comparison with Mikkelsen's course in light wood in Denmark, Judd's in England, and some of our American courses. The plan of instruction calls for drawing once a week and woodworking twice a week. Fig. 147 is a plate taken from Herr Frenkel's interesting course.

Visits to the Lette Haus and the Pestalozzi-Froebelhaus gave me a chance to see some excellent technical school work for girls. The former is an endowed institution offering a great variety of courses, such as cooking, plain sewing, dressmaking, embroidery, designing, mending, bookbinding and photography. One was impressed with the completeness of the equipment and the thoroness of the work. For example the course in mending was essentially a trade course for women who make a business of mending fine fabrics. Besides the ordinary mending they were taught to mend lace, crochet work, and velvet. Great skill was shown in some of this. In the photography department instruction was given in "touching up" photographs for photo engraving. The half-tone engraving, Fig. 148, has been made from a photograph which I purchased from the student who did the art work on it. It

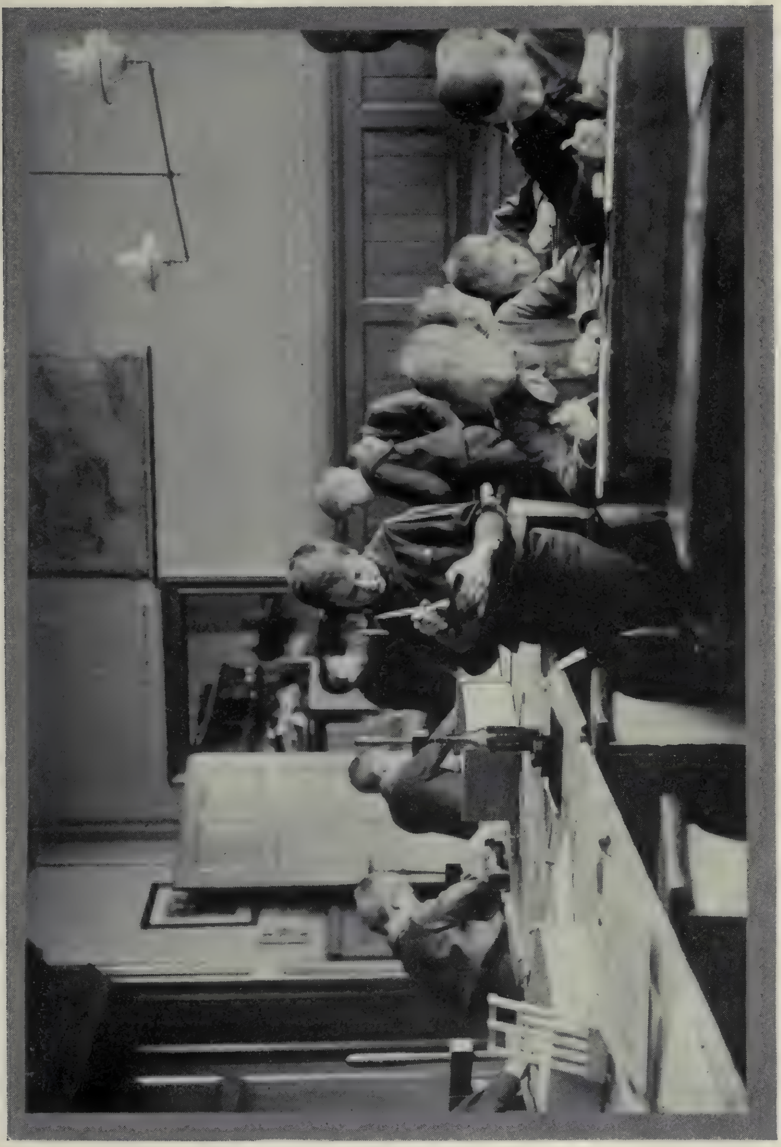


FIG. 146. CLASS IN LIGHT WOODWORK, BERLIN.

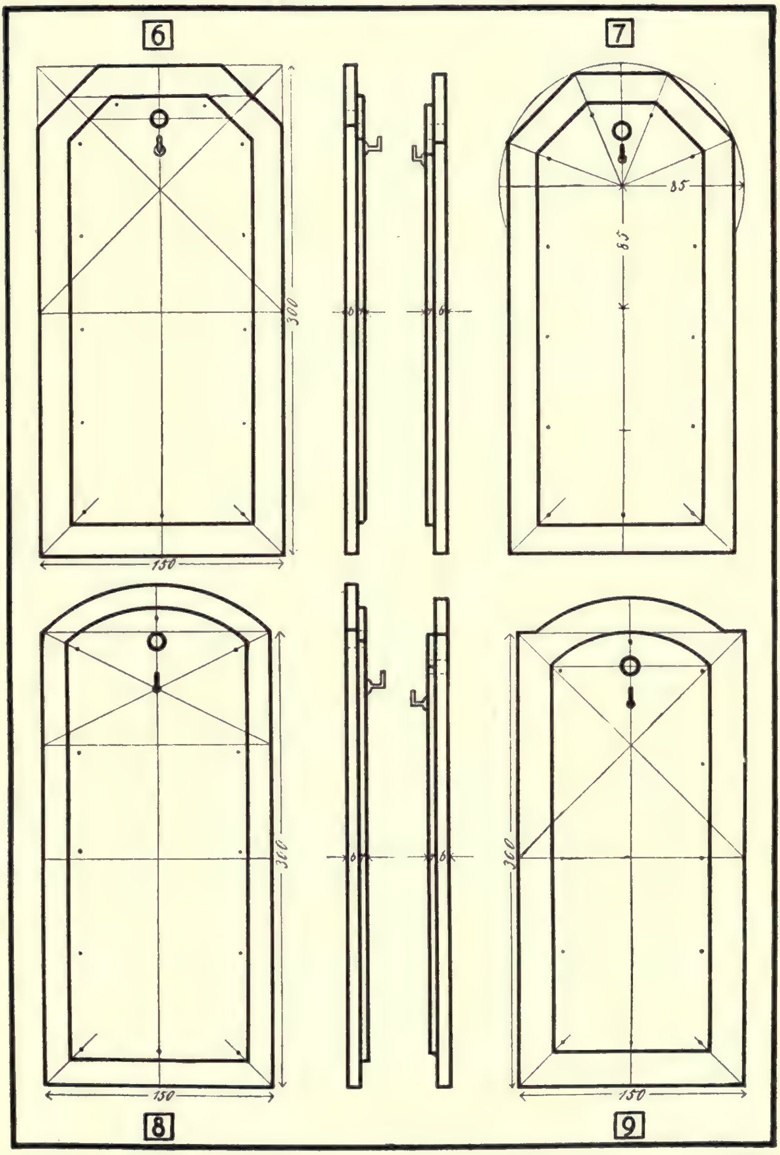
not only suggests the character of the work done by the students but it represents the interior of one of the cooking rooms in this excellent school. At the Pestalozzi-Froebelhaus many young women were being trained as teachers of domestic science and domestic art.

THE CONTINUATION SCHOOLS OF CHARLOTTENBERG.

While at the Lette Haus I met Dr. Frederick W. Roman of the State Normal School, Bowling Green, Kentucky, who had been sent to Germany to study education. He was making a special study of trade and continuation schools, and invited me to go with two other Americans to visit the *Fortbildung* School in Charlottenberg. We reached the school at about six o'clock in the evening, and were at once welcomed by the director, A. Haese. We visited a class of stone masons who were learning about the manufacture of artificial stone. During the day these young apprentices learned the practical side of the trade and in the early evening hours they were taught the theory, and improved their general education. The lesson was illustrated with blackboard sketches by the teacher who was, or had been, a mason. We spent considerable time in a class of bakers whose lesson that evening was arithmetic and letter-writing. The teacher was a master baker. The method of instruction while we were in the room was oral. In this course the apprentices were taught all the mathematics that a German baker would ever need in his business, and this was taught thru practical problems relating to that business. The principles might be the same as taught to the masons and the carpenters and the tailors and the barbers, but the applications were different. For this reason the apprentices of the several trades were taught separately and those from each trade by a master craftsman in that trade.

At the office Director Haese gave me the following data concerning the work under his supervision. In Charlottenberg there were three thousand students in continuation schools. These represented forty different trades. This continuation school work was obligatory upon all boys who would become masters or proprietors in their trades, and they must pass an examination before they could be recognized as workmen or get more pay than that of an apprentice. The required course for each trade was three years. The number of hours a week for the masons, for example, was ten in the winter and two in the summer, these two hours in the summer being given entirely to drawing. The

R. Frenkel, Die leichte Holzarbeit in Verbindung mit dem Linearzeichnen



Tafel 2

FIG. 147. PROBLEMS IN LIGHT WOODWORK, BERLIN.

continuation school work was scattered, being in several old buildings in different parts of the city, but the director was looking forward to a new million-dollar building centrally located to accomodate all the classes.

The class unit was twenty-five students. To suggest the scope of the work, I give the following list which I copied from the blackboard in the director's office: bookkeepers, fifteen classes; machinists, five; locksmiths, seventeen; pipers, four; electricians, seven; cabinet-makers, four; glaziers, three; masons, seven; interior painters, six; stove-setters, two; gardeners, two; bookbinders, three; tailors, two; shoemakers, two; upholsterers, four; bakers, six; waiters, two; barbers, three; commercial work, six; messengers, twenty-three; backward pupils, one.

Shopwork was taught to two of the classes of glaziers, but in Charlottenberg it was not common to give shop instruction in the continuation schools. The pupils in the classes designated "commercial work" are not apprentices. They receive larger pay. They enter this class and seek employment because they are poor and unable to work for the very low apprentice wages during the long period of apprenticeship. The classes designated "messengers" are similar in some respects. When they leave school at the end of three and a half years they still belong to the ranks of unskilled labor. They have, however, gained considerable schooling beyond the *Volksschule*.

In addition to the above there were the following voluntary classes: English, five classes; French, four; bookkeeping, three; correspondence, one; stenography, four; typewriting, four; penmanship, two; postal work, one.

I learned that ten per cent. of the boys continue to do voluntary work in this school after seventeen years of age, or the end of their apprenticeship, and many go to other schools for special instruction of a technical character. The director was pleased to point out, also, that of the three thousand students in the school, five hundred were taking more than the required number of hours of school work.

HIGHER TECHNICAL SCHOOL.

Of all the schools I visited in Berlin none appealed to me more strongly than the higher technical school on Strassman Street. The work in this school might be grouped around four trades—cabinet-making, art forging, machine construction, and making instruments of precision.

FIG. 148. COOKING ROOM, LETTE HAUS, BERLIN.

The shops in this school were more like factories than most school shops. In the woodworking shop we found all the machinery of a modern German factory for cabinet-making—even a wood-carving machine. In the forge-shop there were large forges and a great variety of tools, including drill, power hammer and shears. The machine-shop was well supplied with the best of machine tools, among which I noticed several of American make.

The courses of instruction were quite in harmony with the aim of the school, which was to turn out the highest type of skilled workmen and practical designers. No mere exercise pieces were found in the machine-shop; all work was done in constructing machines that were finished and used in the shop or elsewhere. The exhibit of instruments of precision included a surveyor's level, a galvanometer and various other instruments used in physics and engineering laboratories. The products of the cabinet-making department were shown in a beautifully furnished office for the director, and a museum where students went to sketch and gather ideas of design. The course in drawing began with simple geometric problems and object drawing, and advanced slowly to the designing of a doorway and later the complete decorative scheme for a room done in perspective and color. Before such colored interiors were undertaken, however, the student must have completed extensive courses in geometric and projection drawing, principles of perspective, object drawing, styles of ornament, and color.

Many of the students in the drawing classes were men from twenty-five to forty years of age. In fact the report of the school for the year 1907-1908 shows that seven students that year were between the ages of thirty-five and sixty-three, the largest number being between twenty and twenty-five.

In the hallway was a large case filled with the products of the forge-shop. When I looked into this case I concluded that this school had been fortunate in securing so many rare examples of medieval wrought iron work. Great was my surprise when I was told that they were all made in the school. They had been copied in form and method of production from the finest pieces in the German museums. A little later while passing along another part of this same hallway I stopped involuntarily before a beautiful cabinet and took a second look at it. I seemed to be looking at a rare old Gothic cabinet that had attracted my attention only a few days before in the National Museum in Munich. "Isn't this like the one in Munich," I asked. "It is an exact duplicate"

replied the Director. Then he told me how they sent the professor of cabinet-making to Munich with sketch-book and camera and palette; how he spent all the time necessary to get accurate data of form, color, design, matching of woods, and construction; how he returned to Berlin and with his students made working drawings of the cabinet, and then constructed it in the shops by the same methods used by the Medieval builders. I was amazed. I was told, however, that this was not uncommon. Many other pieces of furniture and metalwork in this school were replicas of the finest examples of old German work. I soon began to see why this school attracts students from Sweden, Norway, Russia, Denmark and other European countries, and why Germany is leading the other nations in workmanship. Here and in other similar schools she is bringing the students up to the standard of the best period of German craftmanship, and to this she is adding experience with the best of modern machinery and machine methods of construction. Finally, she is giving them a most extensive and thoro course in design and in its application to the several industries.

(*To be continued.*)

EXAMPLES OF CEMENT
WORK DONE BY STUDENT IN PENNSYLVANIA MUSEUM
AND SCHOOL OF INDUSTRIAL ART.

ECONOMY IN THE MANUAL ARTS.

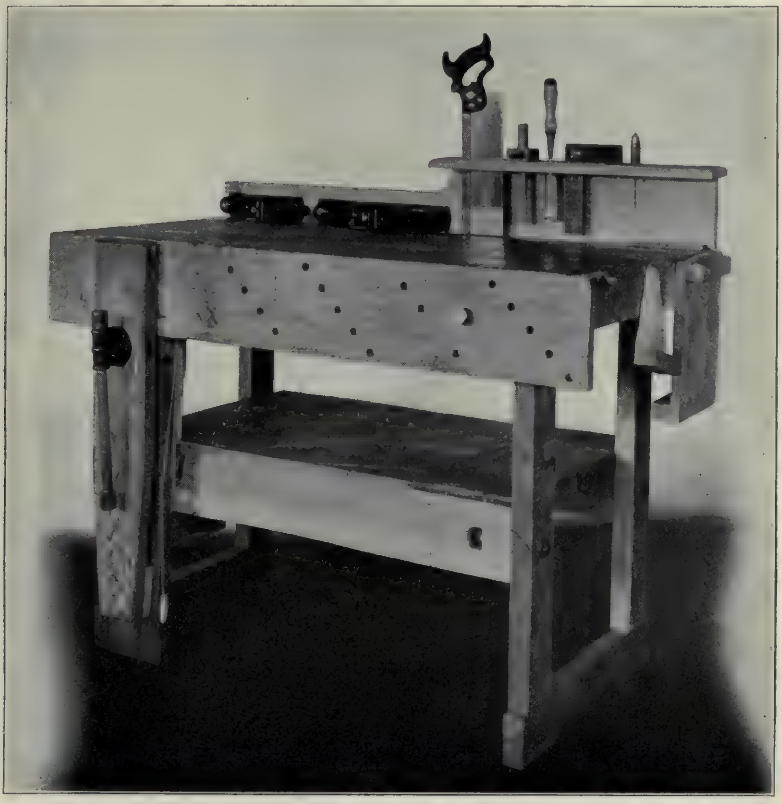
F. H. Beckmann.

IT is now generally admitted by those who are connected with school work that industrial training is just as important in education as academic training. That the training of the hand is recognized as an important factor in the development of the brain, is evidenced by the fact that each year an increasing number of schools are installing equipment for some kind of manual work. At present there are very few of the larger school systems that have not included provision for industrial education. There is probably no school in the United States that would not offer industrial training if it were not for the expense involved. Surely, those who do not believe in such a system of education do not understand its purpose. Large and small schools alike are endeavoring to give this broader development to the student. Many are doing it on a small scale to be sure, but nevertheless, what they are doing proves their interest and belief in such work. It is only a question of time before every school will be giving handwork, not only because it has a content of its own, but because it tends to help those students earn a livelihood who must discontinue school work before graduation from high school.

Realizing the necessity for manual training and domestic science in all the schools, this article is intended for those who, on account of lack of finance, are unable to install equipment and sustain the cost of maintenance. This article, with the help of the accompanying drawings and photographs, attempts to show what has been accomplished in one of the enthusiastic schools of eastern Washington, at Garfield. Had it not been for this inexpensive equipment, it would have been quite impossible for this school to offer the manual arts course, but, as a result of careful planning, it was possible to introduce handwork in all the grades and the high school.

At the time the classes were organized, all the equipment available was a bench and a limited set of tools used by the janitor in his repair work about the school. In order that every boy might work, planes, saws, and chisels were brought from the homes until the tools that had been ordered arrived. The construction of the woodworking benches was necessarily the first thing attempted. It was not long before the material for sixteen had been "roughed out." The best workmen did

the planing, mortising, and finishing while the others prepared the material. At first only the high school students were allowed to work, but as soon as the benches were completed the seventh and eighth grades were admitted to the shop to make bench-stops and bench-hooks. The



WOODWORKING BENCH.

fifth and sixth grade boys were given the shopwork as soon as the equipment was available. Fir lumber was used because it is cheaper and more durable than any other grown in this section of the country.

In constructing the vises, common bench-screws costing one dollar apiece were used. When the bench was assembled, the material, including the bench-hook, bench-stop, and vise-screw, cost three dollars and twenty-two cents. This figure will, of course, vary in different sections of the

country according to the cost of material Altho woodworking benches may be made at a lower cost, the durability of the ones herein described will warrant the additional expense. One can proceed with a small number of tools, but a good bench and a vise are quite necessary for fine work.

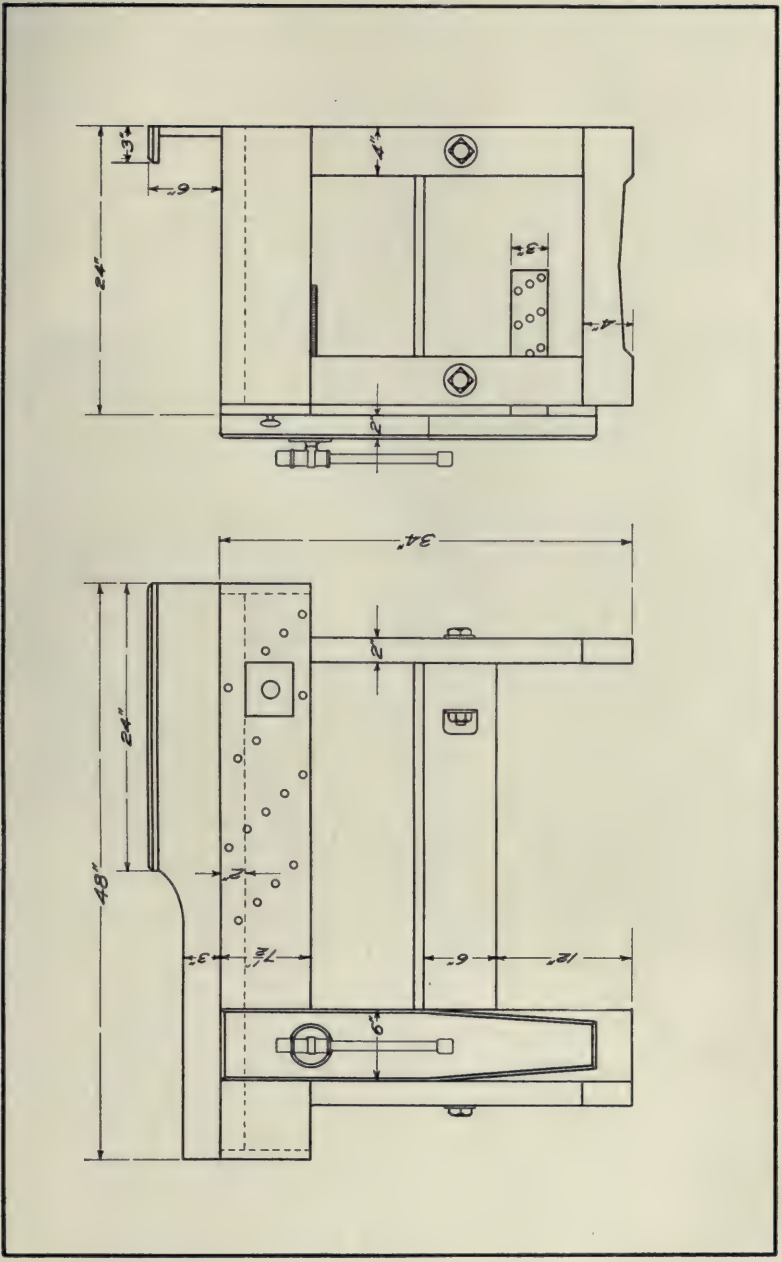
BILL OF MATERIAL FOR BENCH.

1 pc. 2″ x 24″ x 48	4 pcs. 2″ x 4″ x 23″
1 pc. ¾″ x 6″ x 48″	1 pc. 2″ x 6″ x 34″
1 pc. ¾″ x 7½″ x 48″	1 pc. ¾″ x 3″ x 24″
2 pcs. ¾″ x 7½″ x 24″	1 pc. ¾″ x 3″ x 12″
1 pc. 2″ x 6″ x 30″	4 8-inch bolts.
2 pcs. 2″ x 6″ x 35″	1 12-inch vise-screw.
4 pcs. 2″ x 4″ x 28″	

The cost of tools is about the same in every locality. The number and quality to be purchased will depend largely upon the amount of money available. In this particular case only one hundred and fifty dollars was spent for tools the first year. Each individual bench was furnished with the following:—jack-plane, back-saw, sloyd knife, ruler, 1″ chisel, marking-gage. The general tools included only those that seemed necessary for the first year's work. The panels for general tools were made of material taken from drygoods boxes and covered with burlap. A border of ½″ fir completed them. The four panels cost forty cents. A large box was converted into a cabinet for paints, nails, etc. Enough lumber remained after the benches had been completed to construct a fair sized lumber rack. Thus far the equipment for woodwork had cost as follows:

16 benches at $3.22	$ 51 22
Tools	150.00
4 general panels	.40
Total	$201.92

As soon as the shopwork was well under way the primary handwork was begun. In order that the expense of the paper and cardboard course might be kept at the minimum, scissors were brought from the homes, and rulers were made by the boys in the shop to suit the different grades. The rulers for the first grade were divided into inches and halves; those for the second grade, into inches, halves, and quarters; those for the third grade, into inches, halves, quarters, and eighths; those for the fourth grade, into inches, halves, quarters, eighths, and sixteenths.



WORK-BENCH.

Looms were made also, and instruction in primary weaving was given. The knitting was done on toy knitters made of spools and small staples. The equipment for the first four grades cost less than one dollar.

HOUSEHOLD ARTS.

Three sewing tables, each large enough to accomodate six girls, and a set of shelves for material concluded the equipment for the sewing room the first year. The actual cost amounted to $5.32.

COOKING TABLE.

Ordinarily, the cooking equipment is a very expensive addition to the school. This, however, need not be as costly as some would have it, in order that good results may be obtained. In this school two tables, each containing four sections as shown in the photograph and drawings, were installed. Sixteen girls can be accomodated at one time. The total cost of constructing the tables, including the cost of zinc with which tops were covered, gas-plates, bunsen burners, gas-piping, hinges and catches, was $38.80. Other equipment, such as towel-rollers, sink, drain-boards,

stools, shelves, and two gas-ovens, amounted to $13.85. Material for the sewing, and provisions and utensils for the cooking, were supplied by the girls. Therefore, the cost of equipment and maintenance for the first year's work, not including the salary of the instructor, was $52.65.

MECHANICAL DRAWING TABLE.

BILL OF MATERIAL FOR ONE DOUBLE SECTION OF THE COOKING TABLE. END SECTION.

1 top ¾″ x 28″ x 18′ 0″
7 pcs. ¾″ x 1½″ x 23″
2 pcs. ¾″ x 17″ x 23″
4 pcs. 1¾″ x 1¾″ x 33″
4 pcs. 1¾″ x 1¾″ x 26″
1 pc. quarter-round 12′ 0″ long.
1 pc. half-round 10′ 0″ long.
6 pcs. Ceiling 32″ long.
12 pcs. Ceiling 32″ long.
7 pcs. Ceiling 24″ long.
12 pcs. Ceiling 24″ long.

4 pcs. ¾″ x 3″ x 24″
4 pcs. ¾″ x 1½″ x 26″
Also drawers.
4 hinges.
1 gas-plate.
5′ gas-pipe.
2 bunsen burners.
Zinc for top.
1 door-catch.
1 drawer-pull.

In addition to the equipment that has been mentioned thus far, several manual training classes were able to finish over half the course that was outlined to them before the end of the school year. Several boys completed substantial pieces of furniture.

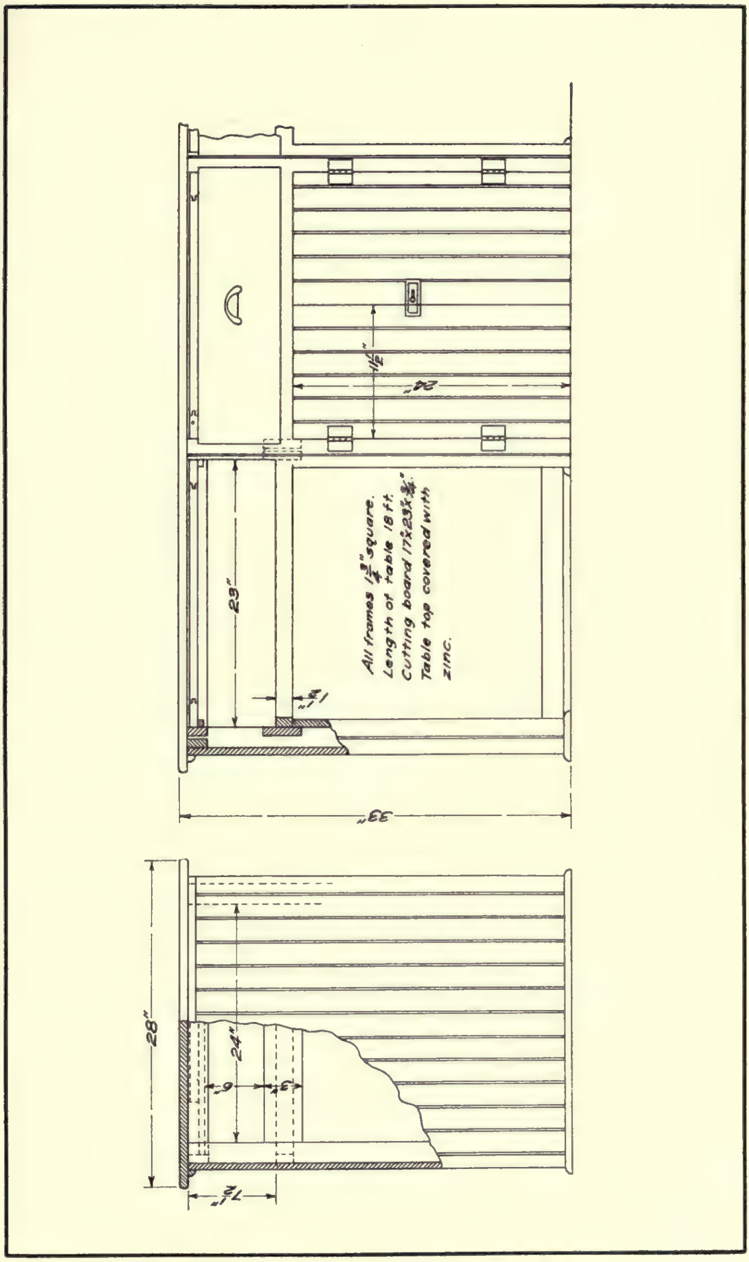
At the beginning of the second year the work of making sixteen mechanical drawing tables was undertaken by the boys of the high school. Sixteen of the best workmen were chosen as foremen and from the remaining group each foreman selected an equal number of helpers. Each group was responsible for the construction of one table. At the end of twelve weeks every table had been completed and the course in mechanical drawing begun. The material in the tables, with the exception of the drawing-boards, was fir. The drawing-boards were made of white pine. Fir ceiling was used for paneling. The cost of constructing and finishing amounted to $2.95. This figure could be decreased by making the drawer-pulls and door-catch of wood instead of brass and omitting the name plates entirely. A single coat of stain may be given if the cost of the finishing is to be minimized.

BILL OF MATERIAL FOR DRAWING TABLE.

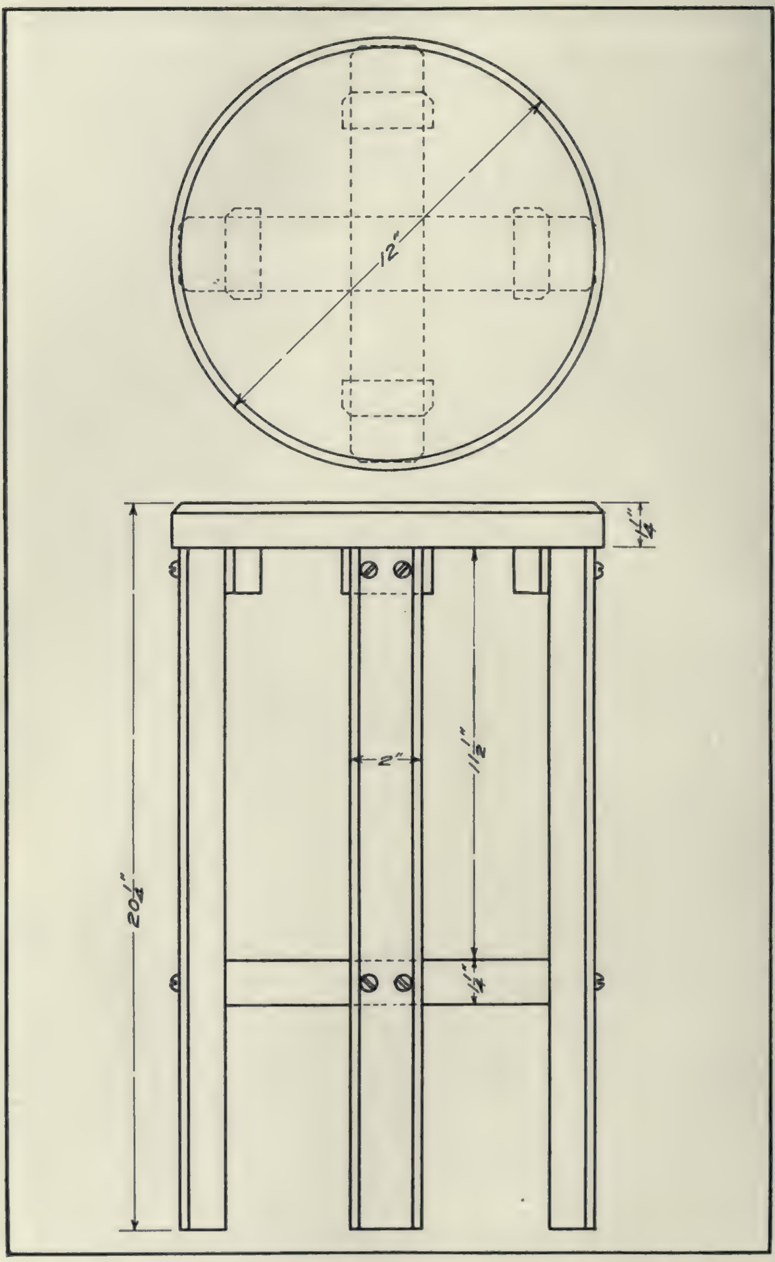
6 pcs.	1¾″ x 1¾″ x 37″	8 pcs.	¾″ x ¾″ x 20″
6 pcs.	1¾″ x 1¾″ x 19″	1 pc.	¾″ x 24″ x 40″
3 pcs.	1¾″ x 1¾″ x 23″		Also drawers.
2 pcs.	1¾″ x 1¾″ x 11″		4 draw-pulls.
1 pc.	¾″ x 24″ x 40″		5 name-plates.
1 pc.	¾″ x 8¾″ x 22″		1 door-catch.
5 pcs.	¾″ x 16″ x 22″		8′ molding, ½″.
12 pcs.	½″ x ½″ x 18″		1 triangle 3″ x 22″.
2 pcs.	½″ x 8¾″ x 18″		35′ 4″ ceiling.
4 pcs.	¾″ x ¾″ x 11″		

Each high school student taking the drawing course supplied himself with the following instruments and materials:—Compass with pen attachment, drawing pen, four H. pencil, six thumb tacks, eraser, cleaner, bottle drawing ink, 18″ tee-square, 8″ triangle 30° x 60°, 8″ triangle 45°, and ruler. The school furnished irregular curves, costing $1.39. Both detail and white drawing paper were purchased by the school, but the drawings were sold to the students for the cost of the paper. In not a single instance was a student unwilling to buy his own drawings. The total cost of installing the mechanical drawing course was:

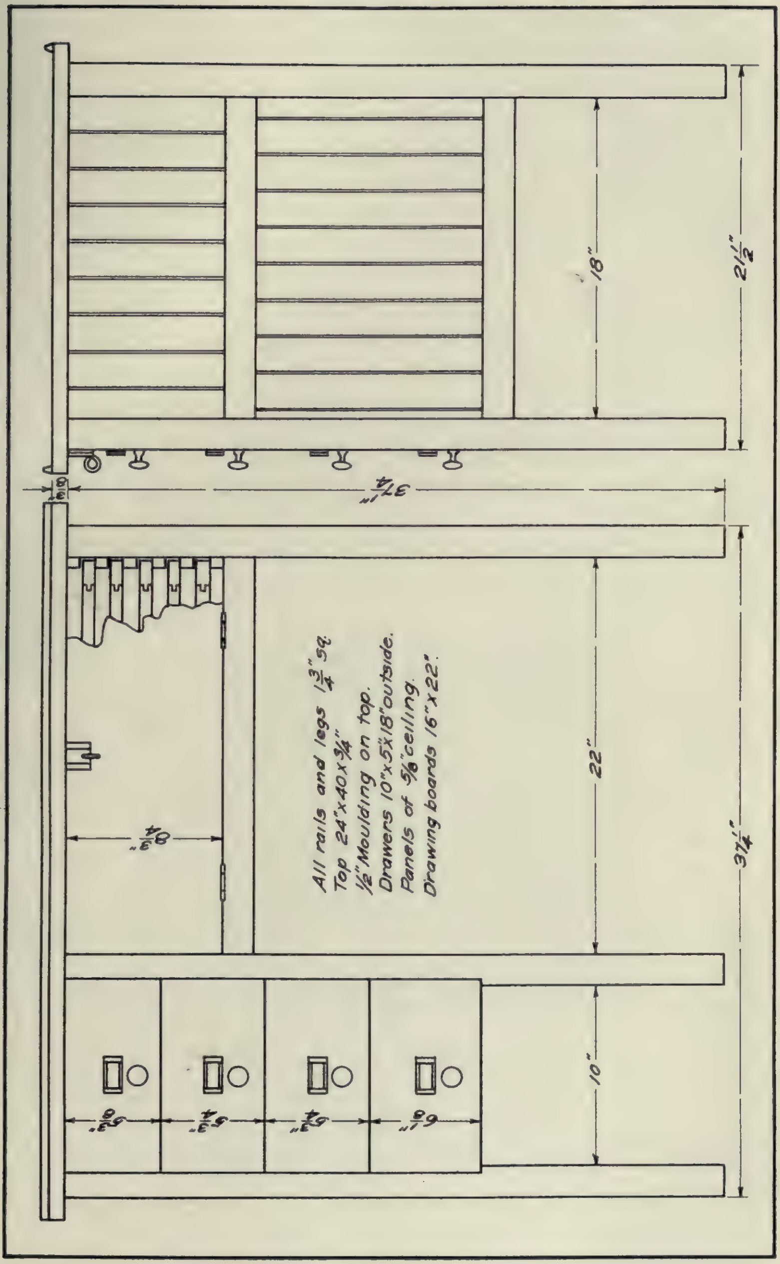
16 tables at $2.95	$47.20
Irregular curves	1.39
Total	$48.59



COOKING TABLE.



COOKING STOOL.



MECHANICAL DRAWING TABLE.

The cost of equipping for the different lines of work, to accomodate sixteen or more in each class, was as follows:

Primary handwork	$ .95
Shopwork	201.92
Sewing	5.32
Mechanical drawing	48.59
Cooking	52.65
Total	$309.43

Provided the classes could be divided into groups of eight instead of sixteen students, this amount could be reduced nearly one half. With the equipment indicated the following work was given:

First, second and third grades: boys and girls—Paper and cardboard construction, weaving, knitting, and basketry.

Fourth grade: boys—cardboard construction and basketry; girls—sewing.

Fifth grade: boys—thin wood construction; girls—sewing.

Sixth and seventh grades: boys—elementary wood work; girls—sewing.

Eighth grade: boys—elementary woodwork and simple furniture construction; girls—cooking and sewing.

First year high school: boys—joinery and mechanical drawing; girls—cooking, sewing, drawing.

Second year high school: boys—cabinet-making and mechanical drawing; girls—cooking, sewing and drawing.

Third year high school: boys—furniture making and mechanical drawing; girls—cooking and sewing, optional.

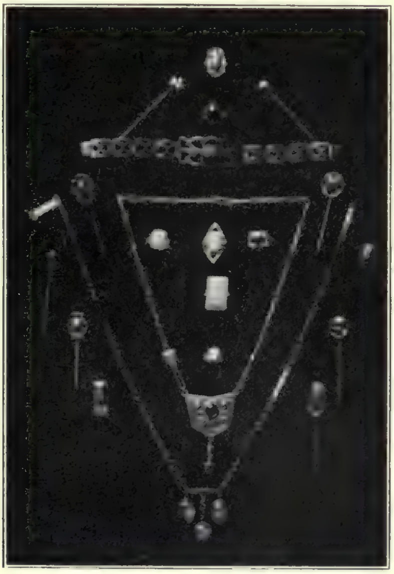
Fourth year high school: boys—advanced woodwork and mechanical drawing.

RAISING MONEY FOR MAINTENANCE.

There are many ways by which money can be obtained for manual training and domestic science and several pages might be filled in telling of them, but all are not practical. A contest between the girls of the school in securing knives and scissors to be sharpened at five cents apiece was tried. Scores of knives and scissors were brought and the boys took great delight in spending a portion of their shop time in sharpening them. To the girl who procured the greatest number of pieces to be sharpened was given a taboret made by the best workman of her class. This plan not only brought in considerable revenue, but also stimulated the boys in caring for edged tools about the home. The boys also took great pride in helping to maintain the shop expenses.

The selling of models and pieces of furniture (made by the students) to outsiders has often been tried, but in very few instances has it proven entirely successful. The real interest in making the problem is not there if the boy knows that he is not to receive the result of his own labor. The models may be sold at cost to their makers who, in turn may sell them at a profit if they so desire. In many cases boys have made considerable spending money from such sales. The money thus received by the school is a great help in meeting the cost of materials.

It has been mentioned before that the girls taking the cooking and sewing courses furnished their own materials, utensils, and provisions. In order to do this, suppers were given every two weeks in the high school. These were not only patronized by members of the school, but by townspeople as well. In addition to the financial help obtained from affairs of this kind, the girls received actual practice in preparing the suppers and serving them.



ARTS CRAFTS, COLUMBUS.

EDITORIAL

WE have made an exchange arrangement with H. Williams Smith, editor of the English journal, *Manual Training*, and regular contributor to the London *Schoolmaster*, which will enable us to publish from time to time brief reports or letters or excerpts from the current English discussion of manual training. Mr. Smith is constantly in the midst of such discussion, is always alert, and an able writer.

It is already known to our readers that the discussion of methods of teaching manual training has been quite as keen in England as in America. For years this discussion centered around the useful model versus the exercise piece. Now that the old theme has become somewhat threadbare, and because of the advent of the child study specialist in England, the discussion has centered on the pupil and the method of presenting problems, whether useful models or exercise pieces. The question may be stated thus: Shall a problem be presented to the class thru demonstration lessons, or shall the teacher avoid all demonstration of principles and leave the pupil to re-discover the correct methods of using tools and the best forms of construction? The former is spoken of as the demonstrational or imitative method, and the latter as the individual or heuristic. The following which was written for the *Schoolmaster* is Mr. Smith's characteristic reply to this question.

Impression Versus Expression

When the ordinary boy comes into the ordinary manual training center is the first thing noticeable in him that he wants to express himself? Oh, no! that he begins at once to absorb impressions from his novel and interesting surroundings. He has that "satiable curiosity" which distinguished Kipling's "Elephant's Child." He wants to examine all the tools and all those nice models on the scheme board; to look under and round the bench, and to work the screw in and out; to peep into the timber store, to turn the grindstone slily, and to dip his nose in the glue-pot. He literally feasts on impressions to such an extent that they surely cannot be digested in one morning. After the usual lapse of a week he returns still impression hungry, and it has got near to term-end before his restless eyes have done roving over the room, and his busy fingers are almost-not-quite indifferent to the nearest object which can be meddled with.

Well, his teacher knows what a prolonged struggle between impression and expression must ensue before the latter takes its pride of place in the scheme of manual education. To utter William James's dictum, "No impression without expression," helps but little unless we are also prepared to say frequently, "No expression without impression," and to act accordingly. But, at the present time, expression has most of the friends and impression most of the enemies. A case in point is the way in which "demonstration" is cried down in the handwork room, and the heuristic methods are cried up. "Don't show; let the boy find out for himself," is the adjuration by any critic at any school. This is but saying, let the child in most instances have all kinds of false impressions, and in the sweet bye-and-bye he will produce a true expression. The great propensity in children to imitation is quite neglected by your heuristic educator. The proneness of children to imitate is one of their strongest natural characteristics. The fact that they are prone to imitate the bad as well as the good ones does not affect the argument. It is for every educator, by the best examples, to use this propensity in children for their moral and physical development. In short, it is for every educator to convey right impressions to the craving receptive mentalities of his scholars. Much of the education derivable from the impressional side of manual training is woven around the demonstration of processes. At practical benchwork the boys must receive suitable impressions by seeing their teacher take the raw material and stage by stage construct an article of beauty and utility. If there is a Scylla of "no demonstration" on the one hand, there is also a Charybodis of "too much demonstration" on the other hand; and we claim that if a teacher try to avoid Scylla he is nearly bound to go to pieces on Charybdis.

Of all bad demonstrational methods none is quite so abominable as that which often accompanies the so-called heuristic, so-called individualistic, kind of instruction. This usually resolves itself into a hurried round of the class, telling and showing, and fuming and fretting, and grumbling and stumbling. Between the menacing rocks lies a safe middle passage for the skilful steersman, and this consists in an unhurried, lucid, entertaining, and instructive demonstration to a large group of boys, but preferably to the whole class, which should be as thoro, and dignified, and lastingly memorable as the practical demonstration of a surgeon engaged in a dangerous operation before his students in the hospital theater. Perhaps the heuristic method may presently prevail in surgery, but that will be another story. Running parallel with this impressional side of his work, the expert teacher will often find occasion to say, "That reminds me," and the impression will then be widened to include some great feat of engineering recently achieved, some story of a great inventor, some application to a near-by object the scholars are familiar with. We would affirm, too, that it should almost amount to a duty in the teacher for him to have always on the stocks, as it were, a piece of work worthy of his own powers of hand, some constructive effort which the boys may watch growing from week to week. We have only furnished one or two examples haphazard as they occurred to us in support of our contention that the impressional side of manual training, far from being neglected, should be exploited for everything it is worth. "As a man thinketh, so is he." We will add, and so acts he: when the impression gets home.

More Time Needed for Manual Training The development of the manual training idea has been an important factor in the profound changes in educational thought and practice which have been brought about in recent years. It is doubtful if contemporary students can justly estimate the contribution that manual training has made to modern education. This influence appears all the more remarkable when one considers the small fractions of time allotted to manual training, within the limitations of which it has been obliged to work itself out. It requires a vivid imagination to conceive of any other subject of study making a secure place for itself and vitally affecting the whole trend of education by its activities in detached periods of forty-five to ninety minutes per week.

Superintendents have realized that the results which have come from so moderate an expenditure of time justify an increased allotment. Modifications in programs and schedules which have been made in many places indicate a tendency toward a readjustment of the school subjects, and a fuller recognition of the importance of handwork.

There is, of course, a point beyond which it would not be expedient to go; there are doubtless supervisors who would soon run out of ideas if their time schedules were suddenly doubled or trebled; it probably requires even more careful study and wise planning to make profitable use of daily than of weekly periods. There are school systems where the boys and girls are reaping the maximum advantages of a rational apportionment of their time among the various lines of work, but the fact remains that the average amount of time devoted to handwork is unreasonably small in view of the results that are expected, and in view of the possibilities that might be realized with judicious expansion.

—William T. Bawden.

A Richer Content for Courses in Manual Arts This very desirable aim will come about only when there is a richer content in the mind of the teacher of manual arts. Just so long as he thinks only about such questions as "Does the coat hanger come before the sleeve board" or "Should I have bent iron work in 4B or 5A," there is little hope for him or the manual arts.

The outlining of a manual arts course does not consist merely in sending for a lot of school reports and selecting here and there something that is "pretty," "hard to make," "makes a good show," or "something novel." By all means send for the reports but do not simply

appropriate models. Appropriate the idea, if it is good, which is back of them. Call it your own; for it will be by the time you have worked it out to fit your local conditions. Five points need to be considered in the selection of an idea: (1) Does it meet the community needs? (2) Does it hold the vital and important interests of childern? (3) Is it adapted to their age? (4) Does it show good taste? (5) Has it the elements of possible correlation with other school studies?

Community needs must be studied. Once a man introduced the manual arts in a tropical country. One of his models was a trousers presser. The pine was imported from the States; so were the tools and benches. The model was made. It was a good one too. But, alas, the people did not wear trousers.

What are the vital and important interests of children to which a model may appeal? If the children like to make a certain model we conclude that they are being educated. Any normal child had rather be released from a desk and a grammar to go to the shop for a couple of hours a week. Who wouldn't? But the interest thus expressed is not always vital and important. A school is a means of expressing one of the phases of the educative process. A teacher of manual arts must see to it that his work is a vital part of this process.

A project must exhibit good taste. An injunction should be placed upon the time-worn topic "The relation of the manual to the decorative arts." A model is good only when it is well constructed, when it is made of appropriate material and of appropriate shape, and when it has an appropriate finish. Candle-sticks made of celluloid or loving cups turned out of pine stock, no matter how "artistic" are the curves, can never be examples of good taste.

If the drawing teacher knows more about design than the teacher of shopwork then the latter should seek advice. It has even been said that some teachers of manual training could give a point or two to the art teacher. However, be that as it may, antagonism between the two must stop—in fact, the superintendent of schools should discharge both if they cannot agree. The children are more important that the Supervisor's pride.

The course in manual arts should do everything that is possible to vitalize the regular book studies. The overworked and sometimes overwrought woman teacher who is trying to teach fractions must be kept in mind. The boys do not understand fractions and see little or no use for them. Possibly the very next hour the boys go to the shop. Does

the teacher of shopwork cooperate? Not always. He says "he is not hired to teach bookwork; he is a teacher of woodwork." He needs to get a better point of view—that he is hired to teach boys. Now what can he do? Let us take one example. A mortise-and-tenon joint made of $1\frac{7}{8}$ inch square stock is to have a tenon $\frac{11}{16}$ inches wide. At what dimension should the gage be set? The blue-print tells the boy. Now the question is, should it?

There is the pile of lumber just crying out for permission to tell something about itself. It wants to tell about the woods of Michigan and of Canada, how the trees grew, the busy life of the saw mill, the ways of rail and water by which it was brought to the school, and a hundred other points dealing with geography. Is it the business of the shop teacher or the book teacher to give an audience to the lumber pile? It is a question that must be answered thru the content in the mind of our teacher of manual arts. The point must be settled. Remember that he is hired to teach boys.

A Richer Content in the Mind of the Teacher

Twenty years ago we "old fellows" had little to talk about except "tool processes," "ripsaw before cross-cut," "iron planes versus wooden planes," etc. We had little or nothing to aid us in our work. If we had possessed the June issue of THE MANUAL TRAINING MAGAZINE filled as it was with varied and appealing interests we would have kept it under our pillow along with our watch. What changes have taken place! Books are now published on bookbinding, printing, arts and crafts, electricity, farm mechanics, etc. The content of the manual arts is richer than ever before. It is the teacher that needs the content now. He needs to outline a point of view for himself as well as a course of study for the boys. One will follow from the other. One young man now getting $4,000 a year was aroused a few years ago when he was occupying a relatively unimportant position with the remark "Why do you teach the coat hanger?" "Why—er, because everybody does." The questioner replied "I advise you to go to the factories, visit the school class-rooms and see what is going on." He did. Enough said, for he received a point of view.

"In what grade shall I put the bent iron work?" is a time-worn question. A better one would be "Shall I have it at all?" "Do I need 24 lathes and 24 benches with a year's course in joinery, five months in wood-turning, and five months in pattern-making?" Of course one says

"yes" if he thinks only of what has gone on before. Perhaps the times have changed. Can a teacher judge a boy's mechanical skill by woodworking alone? Many a machinist who can work to one-thousandth of an inch cannot make a tenon joint. A plumber who can deftly wipe a joint will sometimes saw out a hole in the floor as tho he were a butcher.

Again, are we possibly developing selfishness and parasitism by expecting boys to make things for themselves instead of working on problems that arouse social interest? Does the teacher accept as a gift from the gods the opportunity of having one of his boys repair a broken school door or a desk drawer, of having a group of boys building a fence around the school yard and placing guards around the trees? Does he say that his regular course of study must not be disturbed by any such utilitarian notion and conclude with the remark that the city is rich enough to hire carpenters? Will he have his boys make jumping poles, trapezes, dumbbells, swinging clubs, etc., for a portion of the school plot now going to waste and which might be turned into a playground? Is he willing to put his mortise-and-tenon joints, his nailing exercises, his metalwork, etc., into a house for the girls' department as a model arrangement of house furnishing and building, or will he reply "Buy a portable house"? Will he have the boys print circulars, letterheads, etc., on a school printing press and even issue the school report, with its illustrations; or will he draw a new curve on last year's coat hanger and let his new course of study go at that? Does the teacher of shopwork in a rural high school adapt his course of study to the live interests of his patrons and serve his community by such projects as barn frames, barrel headers, butter workers, harness repairing, use of steel square, trap nests, etc., or does he copy some course of study from an urban school system?

Every teacher of manual arts wants to succeed. It is natural and right. Those who read nothing, visit schools even less, attend no conventions, and join no professional societies will always wonder why the other fellow gets ahead. The teacher who subscribes to four professional papers, borrows two more, reads thoughtfully two books a year on sociology, economics, education and industrialism, belongs to a local board of trade, joins the brotherhood of a church, holds membership in two educational bodies, and attends one annual convention a year, where he not only attends the meetings and takes notes but also meets socially his fellow workers, will come to the front. Is it any wonder? Perhaps he cannot afford to do these things. As a matter of fact, he cannot afford not to do them. Ten per cent. of one's salary should be invested in pro-

fesional improvement. Brain cells depreciate if not stimulated. Every manufacturer allows for depreciation and provides for repairs. Our man, to succeed, must know schools—indusrtial and otherwise. He must know his community and he must know his job—the *job of teaching boys*. Then, and then only, will there be a richer content in the manual arts course. —ARTHUR D. DEAN.

ASSOCIATIONS

EASTERN ART AND MANUAL TRAINING TEACHERS' ASSOCIATION.

Philadelphia lived up to its reputation for hospitality in providing for the meeting of the Eastern Art and Manual Training Teachers' Association on the eleventh, twelfth, and thirteenth of May. Hotel Walton was a pleasant and convenient meeting place with its two auditoriums on the top floor and its comfortable lobby. Then, too, it was so centrally located that one could easily go from there to any part of the city.

The president of the Association, Arthur D. Dean, had prepared a rich program, but he went off to Europe on short notice and left its carrying out in the hands of the vice-president, Walter S. Perry.

One of the strong addresses of the meeting was given by Dr. Cheesman A. Herrick, president of Girard College. His subject was "Avoidance of an Irrational Conflict between Manual Training and Vocational Education." Dr. Herrick began by pointing out that three things were implied in his subject: (1) There is a conflict; (2) it is irrational; (3) it can be avoided. He was quite sure that much of this conflict arose from a confusion of terms. Fifteen years ago we believed that all education of the hand was manual training. Some still hold that view. Then came industrial education which likewise was all inclusive. Commercial and agricultural education have since demanded more consideration. Now the still larger vocational education comes and includes all the others. It is like the serpent that Aaron made—and forthwith Aaron's swallowed all the others. It is evident that clearness and definiteness are needed.

"There are two ends in education," said Dr. Herrick, "general and special." General education is for everyone; it is fundamental. Special or practical education is for groups. Manual training belongs to general education. One school boasts that most of its men go into literary pursuits. Adding a little drawing or a little woodwork to a literary course does not make it lead to any specific mechanical end.

Special or vocational education the speaker would divide into four groups: (1) agricultural, (2) industrial (trades), (3) commercial (business), (4) household arts. These correspond to the professional training of the law and medical schools. The field of uncertainty lies between industrial education and manual training; there is no chance for it with the other three. There is a legitimate field for manual training and another for industrial education, and there ought to be no conflict between them. Manual training precedes vocational training and the latter should not begin too early. In Europe we have illustrations of too early specialization. "I would have been a shoemaker if I had lived in Germany," said a man whose father and grandfather were both shoemakers. This man was a banker having to do with large business interests.

Toward the end of his address Dr. Herrick said that we should distinguish between vocational education and vocational elements in education. There ought to be many vocational elements in elementary school work. These open

the door of opportunity. One of these vocational elements is manual training. Begin manual training earlier; finish manual training earlier—about the middle of the manual training high school; then specialize. Under these conditions there will be no conflict.

From a program of so many good addresses it is difficult to select for a brief report. Mrs. F. H. Colburn, of San Francisco, spoke enthusiastically in favor of a more careful study of prehistoric American design with special reference to giving a characteristic American quality to all designs used in connection with the Panama Exposition of 1915; Leslie W. Miller told why so many American art students are failures; Alvin E. Dodd gave an address on "Vocational Consciousness in Manual Training" which will be printed in full in a later issue of this magazine; Dr. James P. Haney gave a practical talk on the teaching of design which he illustrated with some fine chalk drawing; J. Frederick Hopkins talked pursuasively of the Dresden Art Congress to convene in 1912; Anna C. Hedges discussed the "Relation of Graphic to Constructive Art in Woman's Work;" and William McAndrew entertained a large audience with a humorous address to which he gave the title, "Why I should like to be a Drawing Teacher." He unearthed many defective methods of teaching drawing and held them up as "horrible examples." Perhaps the kernel of his address may be fairly stated in this sentence; There is a basis in the teaching of drawing that is far more important than the intellectual; it is the natural impulses of the children. The most philosophical address of the convention was by Walter Sargent of the University of Chicago. The following summary of it has been prepared by Professor Sargent at our request:

THE RELATION OF UTILITY TO BEAUTY.

"The relation which exists between utility and beauty is a continually recurring subject of discussion. It appears in arguments as to whether certain scenic features shall be preserved for their beauty or utilized for industrial purposes, or whether certain commercial products need to be beautiful as well as useful. On one hand the argument is advanced that nature's contribution to human service is more important than that to esthetic sentiment; and that the first duty of industry is to deliver the goods. On the other hand it is said that appreciation of natural beauty is an uplifting experience necessary to full human development and that sentiments determine attitudes of mind towards one's surroundings.

"In public education the question appears in the discussion between teachers of constructive work and teachers of design as to the relative value of masterly workmanship compared with that of beautiful design. In a question so important, we as teachers need to work towards some clear understanding which will come not from reiteration of opinions but from a comparison and valuation of the contributions of both sides. We should inquire into the nature of the demands for utility and those for beauty.

"Animals appear to have no sense of utility. In general they act directly upon objects with their teeth and claws, and appear to be unable to use any intermediate means as tools to accomplish their purposes because they cannot

hold in consciousness at the same time both means and ends. Inherited instincts result in elaborate processes, but these are practically the same for all members of the species and differ widely from the individual selection of tools to meet particular conditions.

"Man because of his wider grasp of consciousness uses complicated tools and processes as a means of dealing with the external world. He not only employs material tools but has perfected certain subtler and enormously effective means of dealing with his experiences, for example, spoken and written language and drawing, by means of which he can carry on representative transactions.

"Utility is therefore an attainment high in the scale of evolution. It also gives a satisfaction beyond that of meeting material needs; namely, a stimulating realization of mastery over material which is a reassurance to the higher nature and a distinctly esthetic experience. Thus the claim for manual training that it goes beyond the development of mechanical skill and becomes an element of culture is justified.

"But the vitality of the human mind is such that it not only masters the material world but builds up other worlds apparently for the satisfaction of expressing its own nature without regard to material needs. Music is such a world, and art is another. These have become highly perfected means of expression and without a knowledge of them one is shut out from important interpretations of human experience.

"The reason for the appearance of these activities seems to be a craving for expressions of perfected order, for encouragement and occasional rest in the midst of a world composed still so largely of raw material. This demand appears to be as fundamental and insistent as that for utility, and certain inherent principles of preference are evident, which in the midst of the widest range of individual taste lead to some general agreements as to what is universally pleasing. Thus when the useful object is also beautiful another satisfaction is added.

"As an illustration, if an improved seat were needed without delay, a few pieces of lumber might be fastened together to serve the immediate purpose, and purely utilitarian demands would be satisfied. If the chair were to be in permanent use, a more finished piece of construction would be demanded to remove the unpleasant suggestion of half conquered raw material. An added pleasure would be introduced if besides being well constructed the chair had pleasing proportions. A still greater enjoyment would be awakened if a master craftsman worked over the chair until it became a creation which was beautiful because of fine individuality of style, being consistently sturdy or harmoniously graceful. The successive satisfactions are not contradictory but cumulative.

"To summarize, utility and beauty offer not competing but coordinate satisfactions. They minister to demands equally insistent and fundamental. Therefore, teachers of decorative design should know something of constructive work, and teachers of industrial occupations should know something of the arts of design. Both should work together with a clear idea of what each line of work can contribute to make our surroundings minister at once to our utilitarian and to our esthetic needs."

There was no general school exhibit but several of the Philadelphia schools made exhibits in their own buildings. Among these were Pennsylvania Museum

and School of Industrial Art, where classwork was going on, the William Penn High School for Girls, School of Design for Women, Drexel Institute, Pennsylvania Academy of Fine Arts, Spring Garden Institute, Girard College, the three manual training high schools of the city, and the Philadelphia School of Trades. Among the many pleasant social events of the convention was a reception given by Drexel Institute with Dr. McAllister as the host.

CEMENT GARDEN SEAT MADE BY STUDENT AT PENNSYLVANIA MUSEUM AND SCHOOL OF INDUSTRIAL ART, PHILADELPHIA.

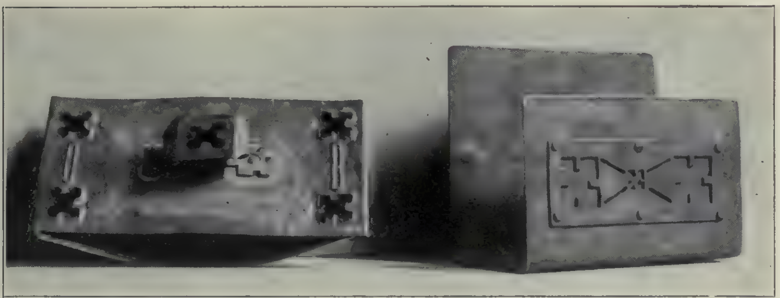
At the business meeting held on Saturday the following officers were elected for the coming year:—C. Valentine Kirby, Buffalo, president; Helen Lucas, Rochester, vice-president; Eva E. Strubel, Newark, recording secretary; Jean Kimber, Philadelphia, corresponding secretary; E. E. McNary, Springfield, secretary of transportation; Thellwell R. Coggshall, Philadelphia, treasurer; H. B. Froelich, New York, editor; C. S. Hamett, Wilmington, and Arthur D. Dean, Albany, executive committee.

The selection of the meeting place for next year was left in the hands of the executive committee. —CHARLES A. BENNETT.

THE COUNCIL OF SUPERVISORS.

The Council of Supervisors of the Manual Arts has been suffering from a chronic ailment for several years. At least this seems to be the general opinion, tho the exact character of the ailment and its cause have been shrouded in mystery. However, this much is definitely known: At the time and place of the meeting of the Eastern Art and Manual Training Teachers Association in Philadelphia last May two secret sessions were held with a goodly number of the councilors

present and that after consulting with a physician the case was pronounced hopeles. Thereupon the Council gave itself most assiduously to drawing up its last will and testament. It is said that the Council will expire as soon as its funeral expenses can be provided for.



FROM THE EXHIBIT OF MILLIKIN UNIVERSITY, DECATUR, ILLINOIS, AT THE SPRINGFIELD MEETING OF THE W. D. AND M. T. A.

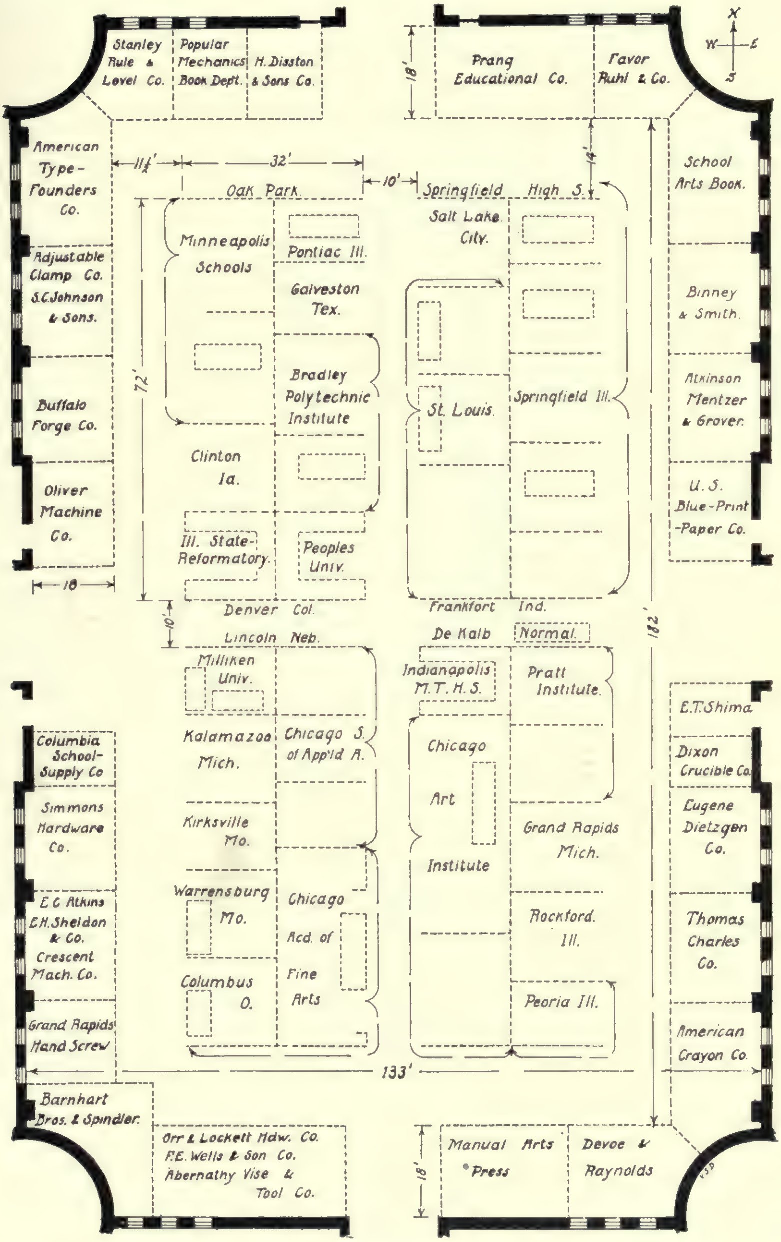
WESTERN DRAWING AND MANUAL TRAINING ASSOCIATION.

The eighteenth annual meeting of the Western Drawing and Manual Training Association was held at Springfield, Illinois, May 2-5, 1911, with a good program and attendance.

Two innovations, so far as this Association is concerned, were introduced at this meeting by the program committee, and notwithstanding obstacles that prevented these special features from being carried out exactly as planned, both seemed to take well with the members. The first was a banquet held at the Saint Nicholas hotel on the evening of the first day. The principal address was given by the president of the Association, Miss Lillian S. Cushman, School of Education, Chicago, who discussed the purposes and ideals of the organization and offered suggestions looking toward further development and greater usefulness

The second special feature of the program was a "Question Box" which supplied the program for the Thursday evening session. Several months in advance of the meeting a letter requesting suggestions of "questions which seem important, relative to the subjects of art education, industrial arts (manual training), vocational training, and household arts" was sent to a number of educational leaders in various parts of the country. From the replies received a six-page folder was prepared and printed, presenting a list of some forty or fifty questions on different phases of the work in which the Association is interested. A few days before the date of the meeting the chairman of the program committee sent copies of the list to a number of the active members with the request: "Will you be one of a group to talk for a period of from three to fifteen minutes on one or several of the questions enclosed herewith? If so, please indicate on the enclosed postal the questions on which you would be willing to

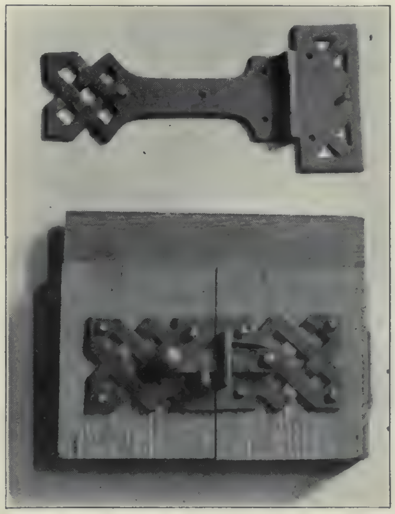
GENERAL VIEW OF EXHIBITS, STATE ARSENAL, SPRINGFIELD, ILLINOIS, MEETING OF THE WESTERN DRAWING AND MANUAL TRAINING ASSOCIATION.



FLOOR PLAN OF EXHIBITS, STATE ARSENAL, SPRINGFIELD, ILLINOIS, MEETING OF THE WESTERN DRAWING AND MANUAL TRAINING ASSOCIATION.

talk, and return as early as possible." The response to this request gave the committee material with which it could easily have filled up three or four hours' time.

The questions which provoked the most interesting discussion are: 1. How far do existing methods in the manual arts have or fail to have a definite intellectual result upon those taking the training? Can we expect art to be given its due in the schools until the communities which support the schools and determine their demands are educated to appreciate art? 3. Should every project in the manual arts in the elementary schools be regarded as a study in fine art? 4. What is essential for an appreciation of what is good in design? 5. Is there any natural or pedagogical sequence in which it is best to take up the various principles of design?



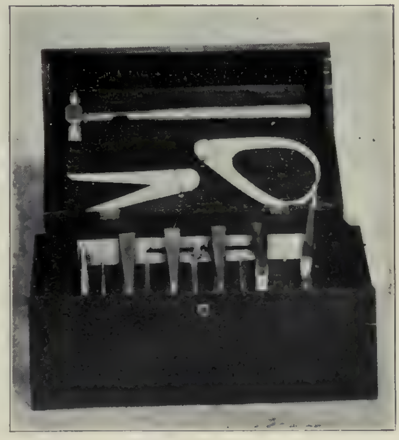
FORGE WORK FROM THE EXHIBIT OF THE ILLINOIS STATE REFORMATORY, PONTIAC, AT THE SPRINGFIELD MEETING OF THE W. D. AND M. T. A.

At the opening session on Tuesday afternoon addresses were made by Superintendent Collins, of Springfield, by representatives of the local city government, by Hon. Charles S. Deneen, Governor of Illinois, and by Miss Cushman, president of the Association.

Governor Deneen referred to the work of the Illinois Education Commission, which had been created by the state legislature at his initiative, and said: "The last two years have been spent by this commission in an investigation as to what is best and most desirable in a public school system in the way of teaching manual training, domestic science and agriculture. This investigation has been conducted by a sub-committee of experts along these several lines selected by the commission. The committee has completed a report, which has just been published, covering the purpose and importance of these subjects in popular education and presenting courses of study thru the elementary and high schools. Those who are competent to speak upon the subject believe that this report represents a safe and sound pronouncement on these questions. It is hoped that as a result of the work of the educational commission, practical studies will have a greater place in our public school system.

"Our country is still in a great measure undeveloped and some of its richest opportunities can be made available for use by the application of knowledge which can be obtained thru the class of studies in which this association and

others like it are interested. The teaching of drawing and of other manual training, I look upon as one of the most important branches of an education best suited to our conditions and I am sure that the work of your association in the promotion of these studies as a part of the education of the American youth is not only of the highest interest to our citizens but of the greatest importance to our future industrial and economic development."



KIT OF AUTOMATIC TOOLS, SPRINGFIELD, ILLINOIS, HIGH SCHOOL.

The response to the addresses of welcome was very fittingly made by Miss Cushman. In her remarks she proposed making the teaching of the manual arts as practical as possible, and urged the uniting of educational forces to work together for the common good.

Much interest was manifested in the Wednesday morning general session at which the topic "Industrial Education" was discussed from the points of view of the sociologist, the student of education, and the trade school superintendent. The speakers and their subjects were: Professor George Meade, University of Chicago, on "The Social Bearings of Industrial Education;" Principal W. B. Owen, Chicago Teachers College, on "The Educational Responsibilities of Industrial Education;" and Superintendent Charles F. Perry, Milwaukee School of Trades, "A Practical Demonstration of Trade School Work of Boys and Girls."

On Wednesday evening Professor F. H. Swift, University of Minnesota, spoke on the topic: "What Should Art Do For Life?" At the Thursday morning general session the program included: "Art in School Pageants," by Thomas Wood Stevens, Chicago Art Institute; "Esthetics in Every-Day Living," by Miss Stella Skinner, Northwestern University;" and "Cooperation Between Community and Schools in an Art Movement," by Superintendent T. A. Mott, Richmand, Indiana, Public Schools.

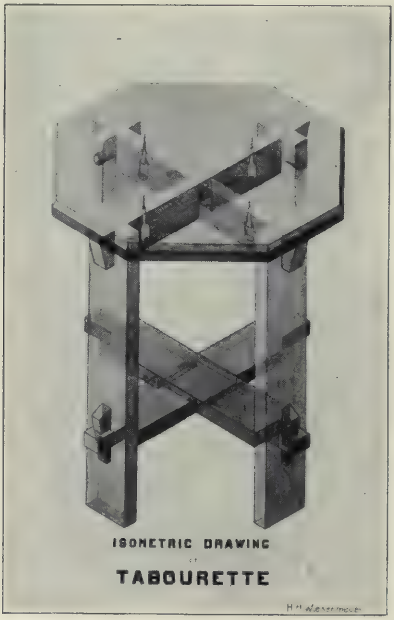
On Wednesday and Thursday afternoons four Round Table discussions were held, as follows: Household Arts, Miss Isabel Bevier, chairman, University of Illinois; Manual Arts, Wilson J. Henderson, chairman, Springfield; Current Problems in Art Teaching, Miss Mary Saams, chairman, Saint Louis; Vocational Training, Frank M. Leavitt, chairman, University of Chicago.

The meeting closed on Friday morning with an address on "Present Educational Problems," by State Superintendent F. G. Blair, Springfield.

At the business session it was voted to hold the next meeting in Cincinnati, and officers were elected, as follows: President, F. D. Crawshaw, University of Wisconsin; Secretary, O. L. McMurry, Chicago Teachers College; Treasurer, Miss Harriet Cantrall, Springfield, Illinois. The chairman of the Editorial Board, from whom may be obtained copies of the Annual Report containing the papers and addresses, is Miss Lucy S. Silke, 3307 Rhodes Avenue, Chicago.

Much credit belongs to the local members, especially Miss Cantrall and Mr. Henderson, for the successful way in which details were provided for. The arrangements for exhibits in the great State Arsenal were by far the best that the Association has known. A drawing showing the floor-plan is reproduced herewith for the benefit of other committees on exhibits.

The commercial exhibits have come to be an important and highly-prized feature of the annual meetings. These were larger in number and in extent of space occupied that ever before. —WILLIAM T. BAWDEN,
University of Illinois.



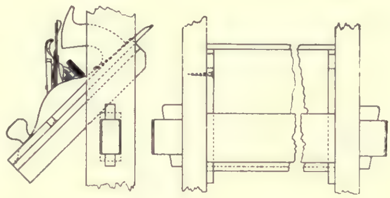
FROM THE SPRINGFIELD, ILLINOIS, HIGH SCHOOL.

SHOP PROBLEMS

GEO. A. SEATON, Editor.

PIANO BENCH.

This is a piece which Hans W. Schmidt of St. Paul has found most effective in the high school. The top may be made in the form of a box of which the seat forms the cover. The space thus made will be found just right to accomodate the regulation size of sheet music. As shown in the detail, the cove moulding is to be made by gouging or planing a groove in a strip of wood which is afterward sawed in two lengthwise. In the original design for this bench the posts were turned with an extension to pass into the box. This necessitated placing the legs too far inside the top and destroyed all the beauty of the design. Accordingly the method shown in the drawing was adopted and has given satisfactory results. In this method the posts are screwed to a ¼-inch strip, which in turn is screwed to the box. The placing of these and other screws is shown in the end view.

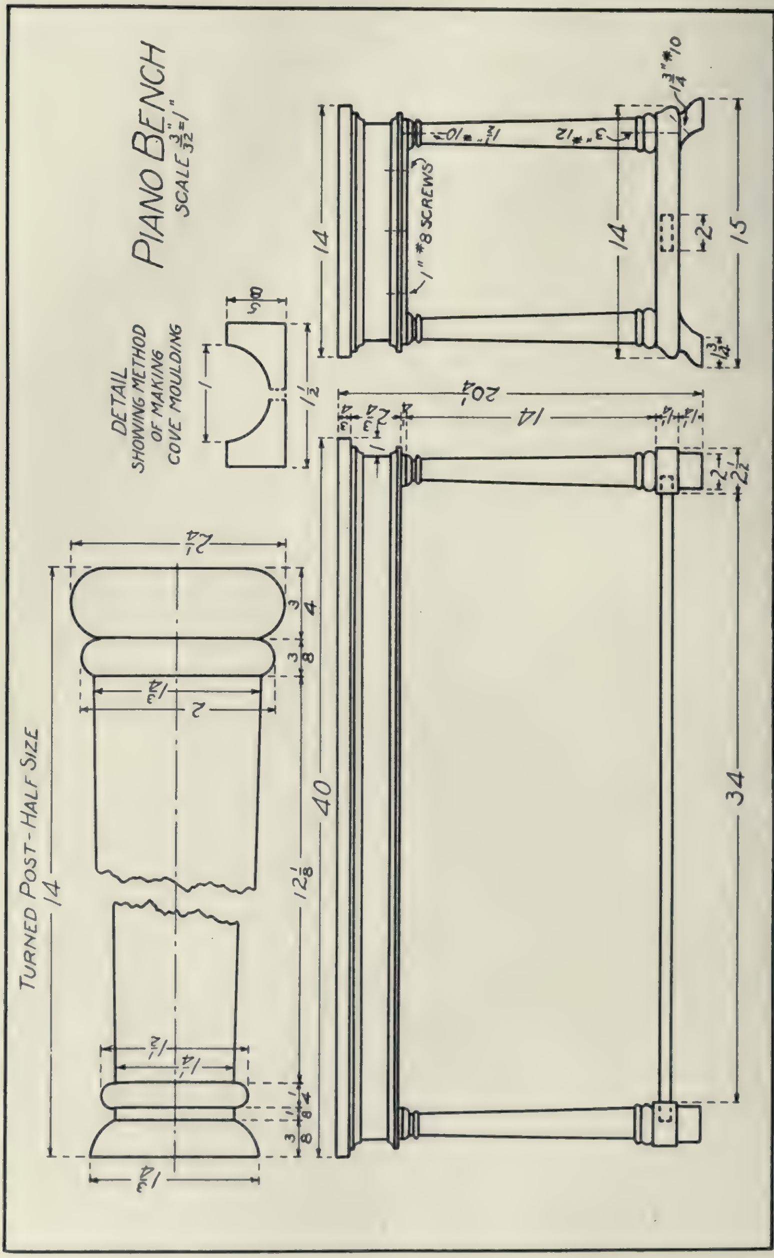


MUSIC CABINET.

This is one of the designs undertaken this past school year in the high school class of D. K. Hiett, Kane, Pa. The cabinet shown was held together entirely by dowels tho Mr. Hiett suggests the possibility of using screws, properly covered by plugs. The rails of the door have a tongue just large enough to fit into the panel groove in the stiles. This joint is further reinforced by two dowels at each corner. This offers a method of framing a door which is very simple yet surprisingly strong.

PINHOLE CAMERA.

There is a sort of mystery about the subject of photograhpy from which arises a belief that good pictures result only from expensive equipment. This is distinctly not so and excellent results in many lines can be obtained with comparatively little outlay. The pinhole camera, so-called, is one of the simplest devices possible, which will produce pictures of surprising beauty. The drawing given here will be just a suggestion of many other forms of camera that could be constructed, from a simple chalk or cigar box camera to the most elaborate type. This camera is planned for the use of plates 3¼ by 4¼, a size most satisfactory for a large range of work. For such a plate the focal distance should range from about 3 to 4 inches for most subjects, and this variation is secured by nailing a number of strips inside the box between any two of which the


PIANO BENCH
SCALE 3/32" = 1"
DETAIL
SHOWING METHOD
OF MAKING
COVE MOULDING
TURNED POST - HALF SIZE
1" #8 SCREWS

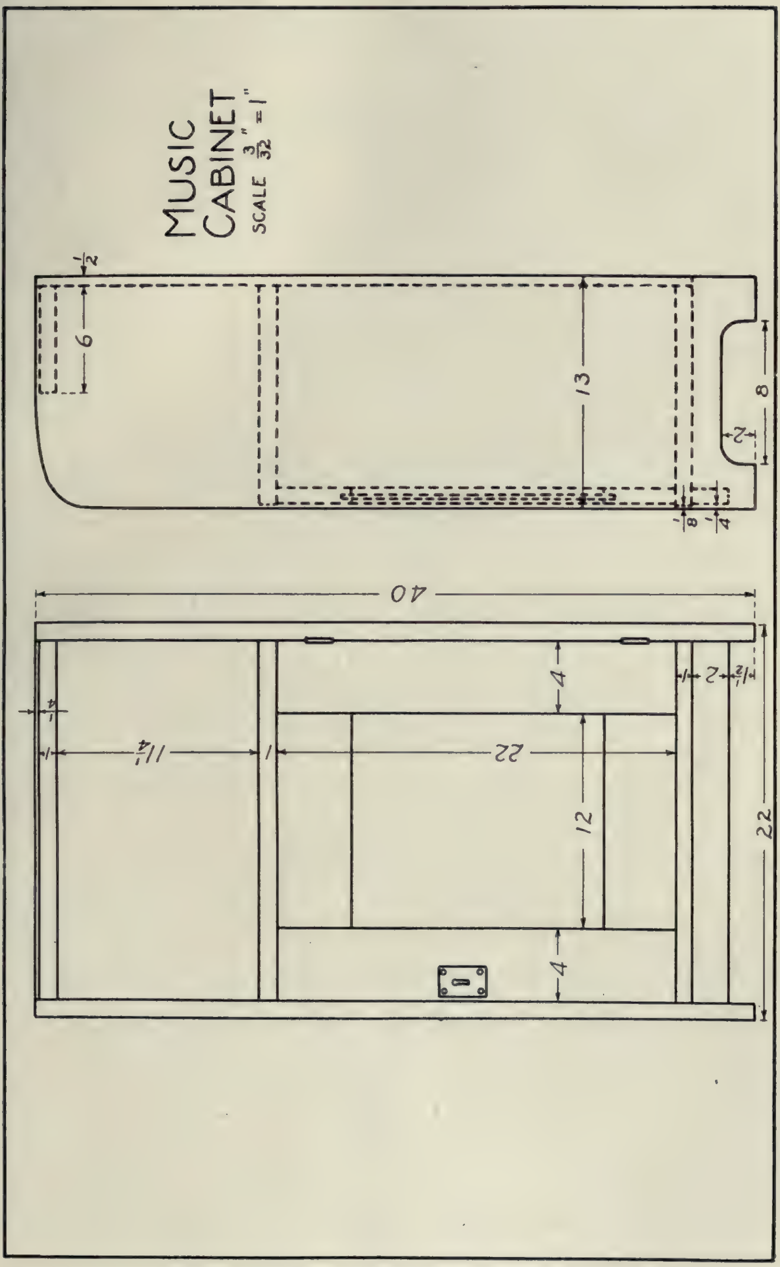

MUSIC
CABINET
SCALE 3/32" = 1"

plate may be placed. A sliding partition fits in one of these grooves and divides the box into two compartments. When it is desired to go on a trip with a camera, the unexposed plates are placed behind this partition. A changing bag must be carried in which to load the camera. When it is placed inside the bag the cover of the camera is removed, a plate is taken from the back and placed in one of the grooves and the exposure made. After the exposure is made the camera is again placed in the bag, the plate is placed back of the partition and a new plate placed in one of the grooves. The exposed and unexposed plates back of the partition are separated by a piece of cardboard. One plate may be loaded at a time if it is desired to load the camera in the dark room. When it is desired to copy other pictures or to make lantern slides the partition is removed and the plate placed at the back of the camera.

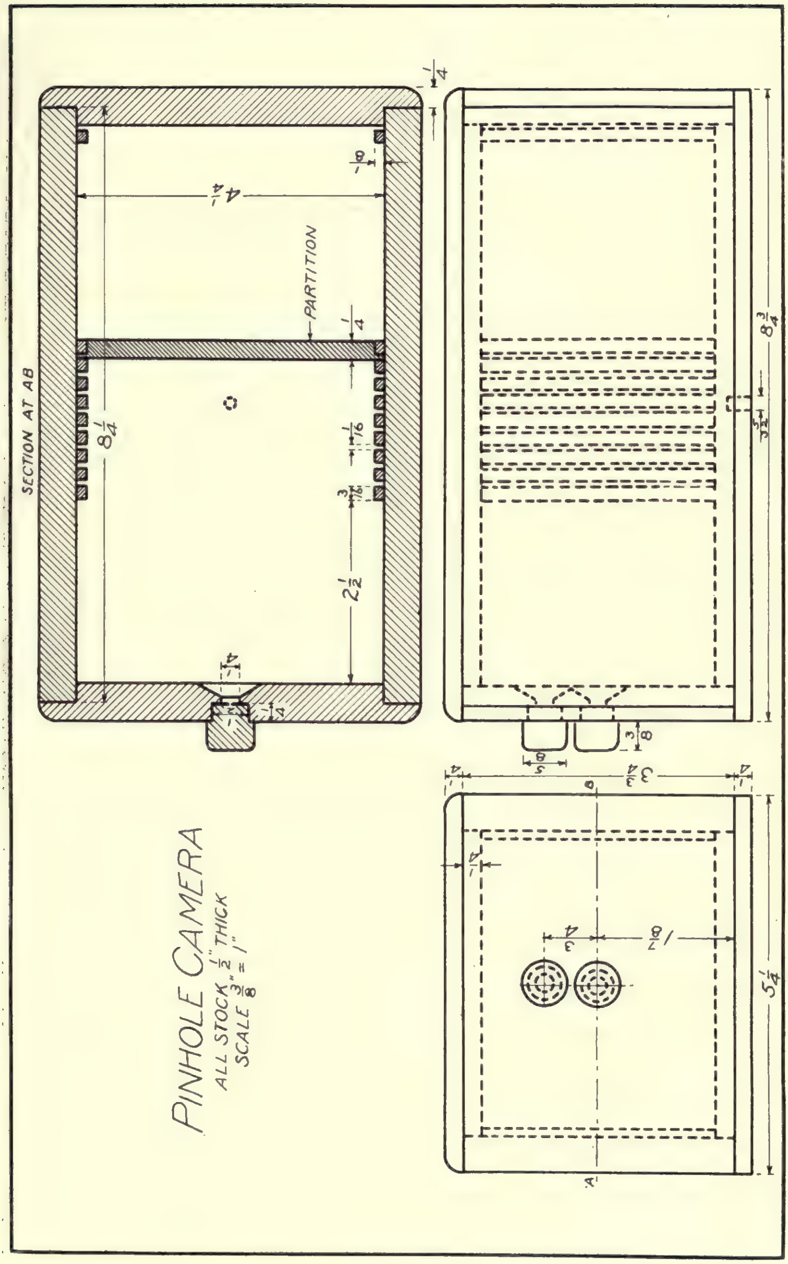
As it is necessary to use the camera on some support, a hole is bored part way thru the bottom and is threaded by twisting a tripod screw into place. The exposure is made by withdrawing one of the plugs in the front of the camera, keeping it out for the required length of time and then replacing it. Where it is desired to cut off an uninteresting foreground the upper plug is used. In other cases the central one is removed. The top and bottom of the box are made with rabbets all around four sides so there can be no chance for light to leak in. The lid is simply held in place by being a fairly tight fit. The inside of the box should be painted a flat black to avoid all reflections of light.

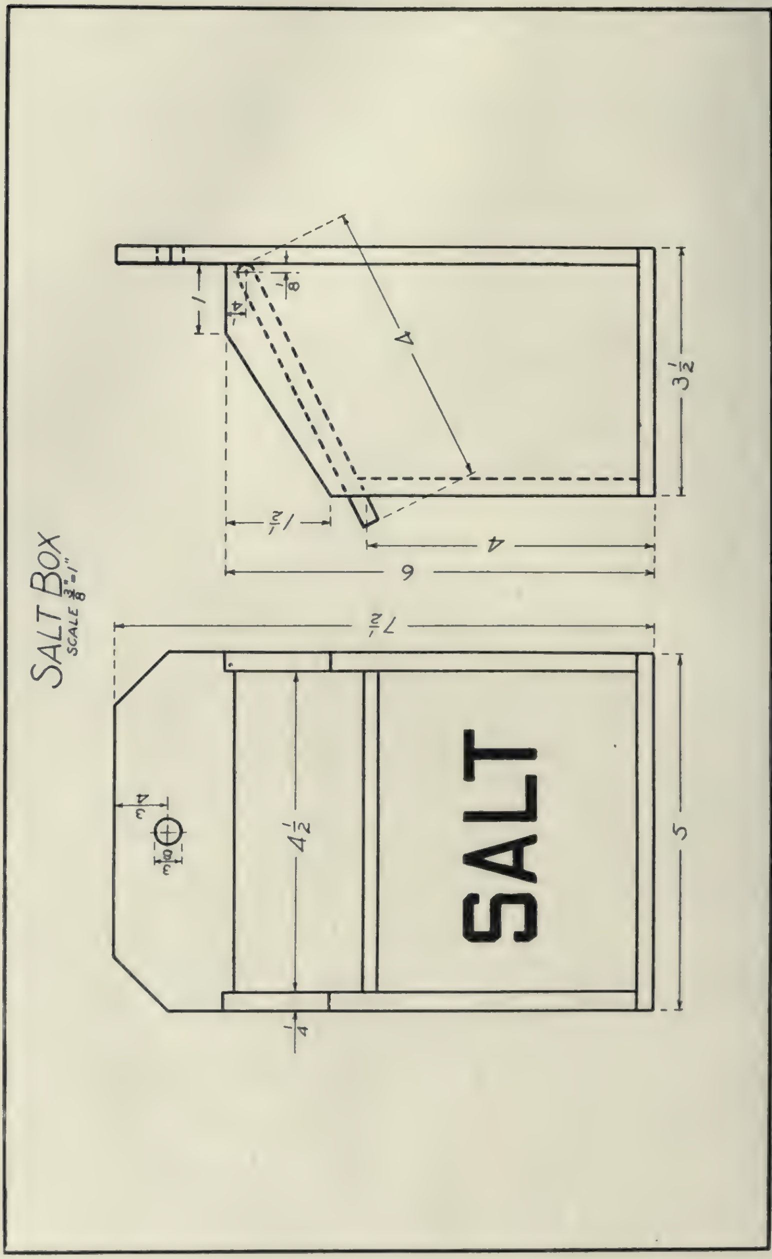
The lens itself is made by taking a very thin piece of metal and making a small round hole thru it. The edges of this hole should be as thin as possible and without any burr. It is customary to make these with needles which are worked thru the metal alternately from one side and then the other until the hole is just as large as the needle. In this way the exact size of the opening can be known and the exposure judged. If the distance from the needle hole to plate is kept at four inches and a No. 8 needle is used, the exposures given in any exposure card for stop U. S. 32 can be used by considering the time to be in minutes instead of seconds. With smaller needle holes the exposures will be lengthened. If the plate distance is decreased, the length of exposure is decreased ½ for every inch under 4 inches. As the plate distance increases the time of exposure is lengthened ½ for each inch of increase. There are exposure tables published for pin-hole cameras which will be quite a help in securing good pictures.

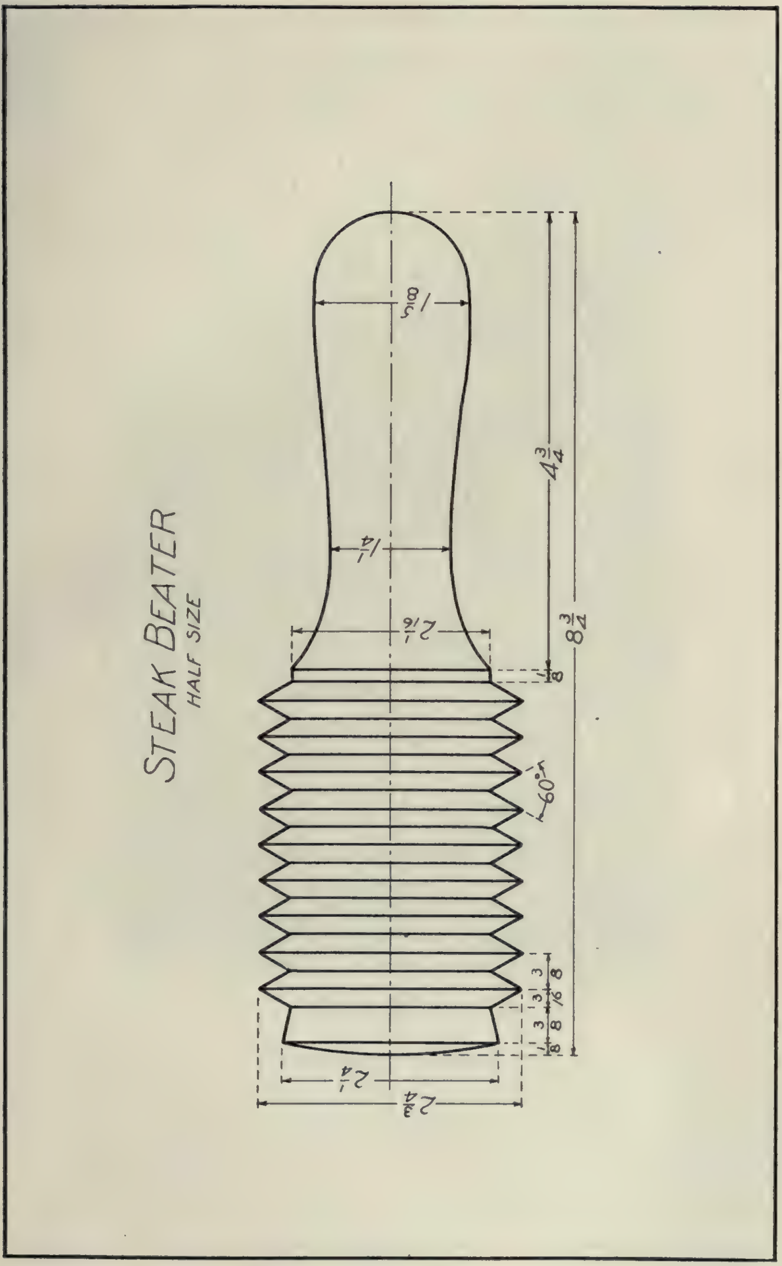
Using a No. 8 needle hole at a distance of four inches, the exposure necessary for an average landscape in the summer time between 10 o'clock in the morning and 3 o'clock in the afternoon will be 6 seconds with the most rapid plates. An outdoor portrait will take about the same length of time, while to copy a well lighted black and white picture indoors will take perhaps 45 seconds.

SALT BOX.

R. Milton Hall of Baltimore, Maryland, has secured good results in his sixth and seventh grade classes with the simple salt box shown. The lid is hinged by means of two ¾″ brads driven thru the sides. In order that the lid may turn without binding the back edge must be rounded off.

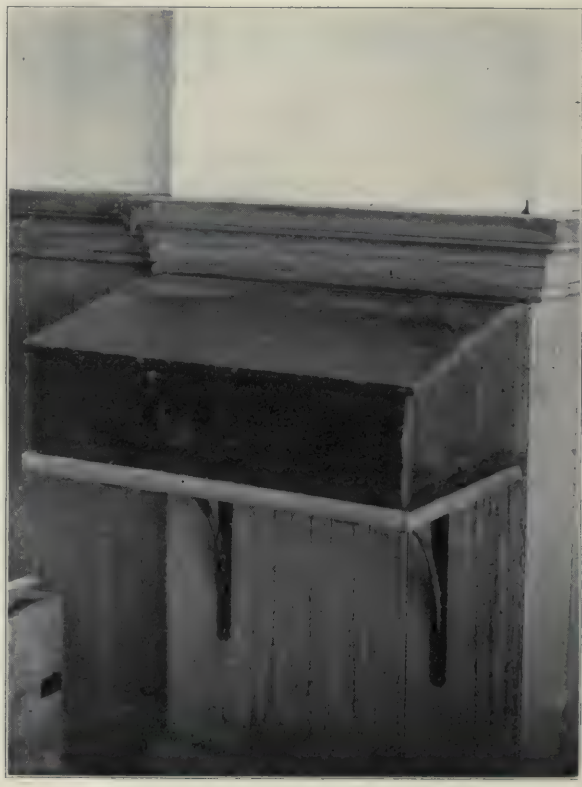

PINHOLE CAMERA
ALL STOCK 1/2" THICK
SCALE 3/8" = 1"
SECTION AT AB
PARTITION


SALT BOX
SCALE 3/8" = 1"
SALT


STEAK BEATER
HALF SIZE
1 5/8
1 1/4
2 1/16
4 3/4
8 3/4
60°
2 1/4
2 3/4

STEAK BEATER.

A problem in turning somewhat akin to the potato masher is found in what is known as a steak beater. When the meat is placed on a meat board it may be pounded by this and will be cut up and softened by the sharp ridges. The end of this steak beater can be utilized as a potato masher if desired.



OILSTONE CABINET.

TOOL RACK.

The drawing shows a form of tool rack used by D. K. Hiett in the schools of Kane, Pa. As made they were 22 inches long, just right to fit the space between the legs of each bench, where they were screwed with an inward slope as shown in the smaller drawing. As the racks were so accessible Mr. Hiett found little trouble in getting the boys to use them. While other schools will probably not be able to use the dimensions given, still the drawing will prove suggestive.

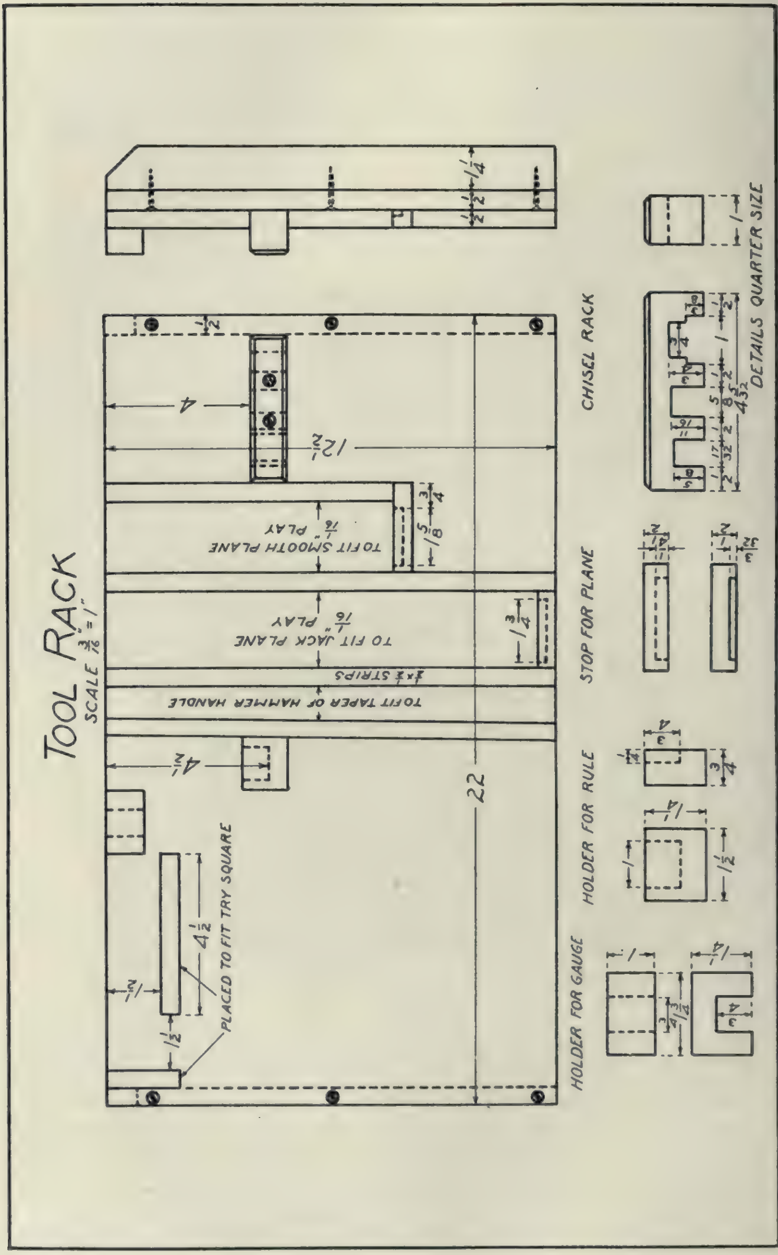
OILSTONE CABINET.

The proper care of the oilstones in a manual training equipment gives the teacher considerable trouble. Charles A. Pettit, Rossville, Maryland, has solved the problem with the oilstone cabinet shown in the photographs. A shelf placed on brackets is covered with sheet tin raised around the edges to catch the oil.

OILSTONE CABINET—OPEN.

The stones are screwed to the shelf from below and everything is covered over with a lid somewhat like an old-style desk except that the front and sides rise with the lid. A button on the wall holds the lid open while the oilstone is in use. A strip of tin tacked on the under edge of the top will prevent the pupils trying their tools here.

This cabinet will help the neat appearance of the room and as many can be installed around the room as the size of the class seems to warrant.


TOOL RACK
SCALE $\frac{3}{16}$" = 1"
TO FIT SMOOTH PLANE
$\frac{1}{16}$" PLAY
TO FIT JACK PLANE
$\frac{1}{16}$" PLAY
TO FIT TAPER OF HAMMER HANDLE
PLACED TO FIT TRY SQUARE
CHISEL RACK
STOP FOR PLANE
HOLDER FOR RULE
HOLDER FOR GAUGE
DETAILS QUARTER SIZE

CURRENT ITEMS

LEGISLATION FOR MANUAL TRAINING AND DOMESTIC ECONOMY.

Legislative activity during 1911 in favor of manual training and domestic economy has brought several states into prominence in the educational field.

The law passed in Maine points to a state-wide approval of the subjects under consideration. The provision of the law which will have the most far-reaching result is, we believe, the second, which directs the trustees of the state normal schools to introduce into those schools such courses in manual arts, domestic science and agriculture as will enable all of their graduates to teach these subjects in the rural and graded schools. This is a great step in advance, for not until all elementary teachers are prepared to teach these subjects in their schools or grades, and prepared to interpret intelligently the directions of the supervisor, will the long-hoped-for results of manual training really appear. Maine has laid a foundation in this wise provision for a system of manual training the development of which will be watched by the whole educational world.

The work of supervision is provided for in the same section by directing that the course in manual training in one of the normal schools shall be so extended as to prepare students for becoming special teachers of that subject. In one other normal school the course in domestic science and art is to be correspondingly extended. The supervisors of these two special extended courses are to act also in an advisory capacity for the whole state, lending their aid and personal attention anywhere in the state that the need may arise. The appropriation for these two courses is not to exceed four thousand dollars annually and is to be in addition to any other sums appropriated for normal schools. The appropriation is to come out of the common school fund.

Another section of the law provides aid for courses in manual training and domestic science in the elementary schools. The aid amounts to two-thirds of the total salary paid to each teacher, provided that the sum does not exceed eight hundred dollars any year for any one teacher. The course of study, qualifications of teachers, and equipment must be approved by the state superintendent before the aid will be granted. The state aid for high schools is apportioned on the same plan, except that the amount is limited to five hundred dollars per instructor.

The superintendent, in furthering the cause of industrial education, is directed to extend the investigation, to aid and advise in introducing courses into the free high schools and academies, and to inspect the special courses in such schools.

In carrying out the provisions of this law arrangements have been completed for extending the manual training course in the Gorham Normal School. It will require three years for a high school graduate to secure the diploma. The course will require a full year of manual training in addition to the regular normal course. The subject will be given the whole three years of the course, one year's work in the subject being required of all students. At the end of the first year certain students will have shown a degree of aptitude for the work which

will make it profitable for them to pursue the special course to completion. In this way, it is hoped, the graduates of this course will be well fitted for the work of special teaching of this subject.

Work in domestic science and art will be introduced at once into all the normal schools. A three year's course is being organized at Farmington State Normal. Miss Marion C. Ricker has general direction of the household arts work. She is a teacher of much experience and has studied at the Boston School of Domestic Science and at Teachers College, Columbia University. The course will include elementary sewing, garment making, textiles, elementary cooking, and table service for the first year; and advanced cooking, menu making, marketing, laundry work, and dressmaking for the second year. The students who, at the end of the second year, have shown special fitness for the work may go on with the third year of the course which will prepare them to become special teachers of those subjects.

WHY PUPILS LEAVE SCHOOL.

An investigation into the causes of pupils' dropping out of high school before graduation was conducted in northern Illinois by F. S. Goodier. He received statistics from twenty-six schools. His conclusions from these statistics throw further light on the relation between this early leaving and practical studies. Nearly all of the superintendents consulted feel that commercial branches, manual training, and domestic science are effective in holding pupils in school for a longer period; and that an increase in the amount of practical work would show still more convincing results. One result of the enquiry is significant; that is, that the cause for pupils leaving before graduation is discovered to lie in a faulty curriculum rather than in outside influences, as so often affirmed. The pupil who leaves because his family need his wages, or because factories or places of business have held out inducements to him, is an exception. Many parents are doing all in their power to cooperate with teachers in keeping their children in school. Business men prefer mature employees—but as Mr. Goodier says, "The students leave from choice. They have lost interest in school, ceased to enjoy it, and probably have fallen behind in their work. This last statement has many exceptions.

"They have lost interest in school for two reasons: First, the course of study has not included the right sort of work. Second, the subjects of the curriculum have not been taught in the right way.

"The reason that the vocational subjects have not gone further to check the dropping out of students in our schools, is that they have not yet found their true place in the curriculum. The entire matter of giving this vocational work is in its infancy. We shall need to experiment much and shall probably err often before the high school course is fully adapted to the need of this 20th century.

"A broader curriculum, including commercial, agricultural, industrial courses and the household arts, is needed to keep our boys and girls from leaving high school before graduation."

RAPID PROGRESS IN MINNESOTA.

Enviable conditions exist in Minnesota where legislation has made possible the maintenance of departments of manual training, domestic economy, and agriculture in every type of public school in the state. In 1909 there was passed a law known as the Putnam act, which provided state aid for a limited number of schools having industrial departments. Only ten high schools were able to qualify for this aid, but so successful were these schools, and so insistent was the demand, that in 1911 the law was re-enacted with such changes as would allow twenty more schools to qualify. Each school fulfilling the requirements will receive $2,500 each year, with $150 in addition for each associated rural school. The schools must employ trained instructors whose qualifications may be fixed by the state high school board. Each school must have connected with it a tract of land of not less than five acres, located within the school district and within two miles of the central building. The instruction must be free to all residents of the district, non-resident tuition being paid by the district from which the pupil comes. In no case is the aid received to exceed two-thirds of the sum expended upon the instruction in such subjects by the school district. No more than thirty schools can be aided in the next two years. Full provision is made in the act for the association of rural schools with a central school for the purpose of obtaining the benefits of such instruction. A board is provided in such cases consisting of the board members of the central school and one representative of the board of each associated rural school. Short courses are arranged for, in all the Putnam act schools, for pupils unable to attend for a long term.

This act, providing aid for a limited number of schools, did not altogether meet the needs of the situation, generous as it seems. This year the Benson-Lee act became a law. It provides state aid to the amount of one thousand dollars for each high or graded school which maintains such courses in agriculture and in either home economics or manual training as the state high school board may prescribe. This aid will not be paid to any school receiving aid under any other act, for the maintenance of industrial courses.

Provision is made, also, in the Holmberg law, for industrial work in consolidated rural schools. A general state aid is allowed to a four-room consolidated school to the amount of $1,500, to a three-room school, of $1,000, and to a two-room school of $750, provided that such schools have a principal capable of teaching the elements of agriculture and that proper equipment for teaching industrial subjects shall be provided locally and that at least two acres of ground be supplied for demonstration work.

In this way Minnesota has encouraged industrial work thruout the state, and reports show that such work is in a flourishing condition. The Putnam act schools are well distributed geographically, thus serving as centers of influence. The two state agricultural schools are to be so improved and strengthened as to provide the highest possible standards of attainment in this work. We notice in the reports the very practical nature of the manual training work. Such articles as single-trees, neckyokes, roadscrapers, wagon-boxes, chains, clevises, gates, stock-racks and fencing are included in the work described.

SLOYD IN INDIA.

The proceedings of the Sloyd conference, held at Mysore late last year, contain much interesting information as to ways and means in India. It is three years since Mr. Larsson left that country after inaugurating his system of sloyd instruction in the province. The work is following closely the paths laid out by Mr. Larsson and is based apparently on very sound ideas. In a paper read before the conference on "Sloyd Work in Our Schools and its Influenc on Our Boys," by Mr. Naraneingar, of the government high school, Tumkur, we find a system of class-instruction described that is very praiseworthy. Ten or fifteen minutes at the beginning of the class-period are devoted to a talk about the materials and tools to be used during the lesson. Then the model is shown the class and discussion follows. "Whatever information is given comes from the children's own initiation and not from the promptings of the teacher." Great care is used to lead the child to discover his errors for himself. When it becomes clear that some feature of the lesson is not working out well, a halt is called. The methods employed are all brought to the pupils' notice and are discussed by them. "By judicious questioning and occasional hints on the part of the teacher, the children are made to discover their own mistakes." When a piece of work is finished the boy is required to pass judgment on it himself, being given a printed form for the purpose. This plan is reported as resulting in better work and increased power to form correct judgments.

The great need for manual training work in India is shown in the statement in the paper in regard to the attitude of society toward labor. He says, "Contempt for manual labor prevails in this country to an alarming extent. The prejudice against manual labor has inoculated the whole spirit of our lives. We have entirely neglected the power and the glorious mission of the hand—that highly evolved organ which differentiates man from the brute."

Among a number of resolutions passed at the conference, which were of purely local interest, was the following, which is good advice for special teachers everywhere: "Resolved that the Sloyd teachers do continue to be in touch with the teaching of general subjects in addition to Sloyd."

PATHWAYS TO DRESDEN.

The Bureau of University Travel has been selected by the American Committee as their official representative for traveling arrangements for the Dresden Congress for the Advancement of Drawing and Art Teaching, in 1912. The Bureau has arranged pathways to the Dresden Congress similar to those arranged for the London Congress in 1908.

Henry Turner Bailey will act as dean of the intellectual interests. This will be welcome news to those friends who owe to Mr. Bailey's presence and efforts such a large share of their enjoyment of the trip to the London Congress. James Frederick Hopkins, chairman of the American Committee, will assist during the trip as much as his other duties will permit. Mr. Hopkins has had very successful experience in interpreting the art of Europe to students on trips abroad.

WORK OF GRAMMAR GRADES AND HIGH SCHOOL, YPSILANTI, MICH., PUBLIC SCHOOLS.

The itinerary will include Spain, Sicily, Greece, Turkey, Italy and Austria; and, after the Congress, Germany, France and England. The Greek cruise of 1908 was charmingly described by Mr. Bailey in an editorial in the School Arts Book. It has been reprinted for the Bureau in a little booklet, entitled "My Odyssey."

A NEW NORMAL ART COURSE.

A Normal Art course has been added to the course of study at the school of the Handicraft Guild of Minneapolis. The course covers two years' work and students must have a high school education or its equivalent for admission. Opportunity will be given for observation of drawing lessons in the public schools and practice teaching will be conducted in the Saturday children's class. A diploma will be awarded to students completing the course successfully.

The course of study for the first year includes drawing from the object and life, perspective, design, stenciling, block-printing, clay-modeling, elementary manual training, art history, picture study and psychology. In the second year some courses will be continued, with added courses in water-color, composition, mechanical drawing, lettering, pottery, metal, leather, history of education, pedagogy, and plans for courses of study.

THE DEATH OF MR. EMMERICH OF INDIANAPOLIS.

By the death of Charles E. Emmerich on June sixth, Indianapolis lost one of her foremost educators. Mr. Emmerich had been connected with the Indianapolis schools for thirty-seven years, the last fifteen as principal of the Manual Training High School. He was a man of marked individuality and great teaching ability. To his efforts and increasing devotion are due the standing of the Manual Training High School and the advancement of the subject of manual training in the school system. As a principal he was especially successful in securing cooperation from his teachers and in maintaining strict discipline with a fine working spirit. At the same time the students were inspired to a personal loyalty. The warm affection expressed by students, alumni, and co-workers alike was remarkable. Mr. Emmerich had been affectionately designated "Manual's Grand Old Man." It has been proposed to change the name of the Manual Training High School to the Emmerich High School, as a tribute to Mr. Emmerich.

Mr. Emmerich was born in 1845 at Koblenz on the Rhine. He served in the Prussian army, until he was twenty-one, when he came to the United States and enlisted as a private. When his term of enlistment expired he took up the work of teaching in Kansas. Later, he came to Indiana and attracted the attention of Superintendent Shortridge of the Indianapolis schools thru a magazine article. He was appointed instructor in the high school and taught German until appointed principal of the Calvin Fletcher School. When the Manual Training High School was built he was appointed principal.

Mr. Emmerich was a firm advocate of the elective system in high schools. It was the handling of this feature of high school management that brought to Mr. Emmerichh and the Manual Training High School of Indianapolis such wide-spread fame. In this school students were required to take set courses

only when planning to attend higher institutions of learning. Thru Mr. Emmerich's direct influence, however, the majority of students were guided into definite courses and to graduation. Mr. Emmerich was responsible for the ruling which makes it necessary for a student to maintain a certain standard of scholarship in order to qualify for athletic contests. His deep interest in athletics and physical culture was helpful to the school in many ways.

CALIFORNIA.

California is still forging ahead in improved facilities for manual training.

The Santa Barbara Normal School of Manual Arts and Home Economics has received an appropriation from the legislature of $140,000 for buildings and equipment, and $25,600 for two years' maintenance. This will make it possible to finish the buildings as planned.

The entrance requirements of the school are as follows: graduation from a college, university, normal or special school; or certificate of attendance for two or more years in such schools with recommendations from the same; or successful teaching experience.

There are four special courses with high school and grade courses in addition. The course in Home Economics includes domestic science and sewing, with prerequisites of elementary chemistry, botany, zoology or biology, physiology or hygiene, physics. The Domestic Art course includes sewing, dressmaking, millinery, textiles, costume design, house furnishing. The prerequisites are satisfactory hand sewing and freehand drawing. The course in manual arts includes construction work for primary, elementary, grammar and high school grades. For women the course includes benchwork in wood, with correlated design and metalwork, paper sloyd, and elementary bookmaking, with ability to use edge-tools as a prerequisite. For men the course includes joinery, turning and forging. The prerequisite for this course is some training in the use of edge tools. The Applied Arts course includes design, and its application in pottery, metalwork, bookbinding, woodcarving, tooled leather, etc. Training in design and ability to model and use craft-workers' tools are prerequisites.

All courses are a year in length, that is ten months. No definite time-period is required for graduation, as this depends upon previous preparation, and credentials as well as work done at the school itself. The diploma of the school entitles the holder to a "special certificate" for teaching and supervision of the special subject studied. Miss Ednah A. Rich is president of the school.

N. Dana Cook, of Stanford University has charge of the course in manual arts for men. Matters of organization, equipment, history and development of the subject will be given much attention in this department.

The Manual Arts high school of Los Angeles made a good showing at its first annual visiting day in June. Forge, foundry, and machine-shop classes were added in September. A fine art-craft course under the direction of Douglas Donaldson is a popular feature of the school.

The high school of Centerville has three new courses this year, domestic science, manual training, and agriculture. Miss Helen Burbank teaches the domestic science and Richard Zeidler teaches manual training and agriculture.

MADE BY BOYS IN ST. CLOUD, MINN., WHO ARE FRIENDS OF THE BIRDS.

F. H. Beckmann has accepted the position as head of the mechanical department of the Tamalpais Union Polytechnic High School of Sausalito. The school has three large departments, the academic, the commercial, and the mechanical. Mr. Beckmann who was formerly in the department of manual training in Everett, Washington, directed the manual training department of the summer school of the Kansas State Normal.

The manual arts department of the Los Angeles State Normal school will be so extended this year as to enable it to train teachers to supervise manual training and domestic economy. The legislature has made an appropriation to cover the cost of a new building and equipment for the advanced work. C. W. Kent is the head of the department with Miss Rachel Richardson as assistant. Miss Belle Whitice will also teach in this department.

The Glendale Union High School of Glendale is to have manual training this year. H. N. Moore is in charge.

PAROCHIAL SCHOOLS COOPERATE.

The Attorney General of Massachusetts has decided that pupils of Catholic parochial schools may attend the manual training departments of the public schools in the state if they wish to do so. The decision was called forth by the request made for such permission by the Rev. E. P. Dunphy of North Adams. The local school committee expressed their willingness to extend the privileges of the manual training work to the boys of the parochial schools. Arrangements will be decided upon by Mr. Dunphy and the committee. Several new departments of manual training will be started to meet the increased demand in North Adams.

From Winona, Minnesota, comes news of similar conditions. Over one hundred children from parochial schools will study manual training and domestic science in the city schools this year.

MILTON BRADLEY.

In the death of Milton Bradley, founder of the Milton Bradley Company of Springfield, Massachusetts, manual training has lost a friend. In the early days when friends were scarce, Mr. Bradley was not only enthusiastic in his support of the work but he was a wise counsellor as well. It was he who began early to promote manual training in the city of Springfield and he who selected and inspired George B. Killon the first teacher of manual training in that city. It was Mr. Bradley who published Mr. Killon's *Knife Work in the School Room* in 1890, the first book on thin wood work in this country.

We are glad that the Milton Bradley Company has issued an appropriate little book entitled "Milton Bradley, A Successful Man." In this is briefly told the story of Mr. Bradley's early life and the first fifty years of the Milton Bradley Company. It tells of Mr. Bradley as a student, and as a draftsman, how he saved money to enable him to attend the Lawrence Scientific School, how his course was cut short by his parents moving to Connecticut; then of his applying

for a position at the Wason Car Works in Springfield and of his work as a designer of cars. But more interesting is his early work in lithography, his invention of a new game which gave the start to a profitable business and especially his faith in the kindergarten which led him to publish books and manufacture kindergarten material when there was no profit, but much loss in doing so. Growing out of the kindergarten work came the Bradley color scheme based on extensive scientific experiments. The book is not merely the record of a successful business man, it is a tribute to an educator and loyal friend of the children and their teachers.

HERE AND THERE.

T. B. Kidner, director of manual training and household science in the province of New Brunswick, resigned in order to accept a position as director of technical schools at Calgary, Alberta. The loss of such a competent director is much regretted by the department of education of New Brunswick. He is succeeded in New Brunswick by Fletcher Peacock, a graduate of Mt. Allison University, and a teacher of some experience in Riverside. Chatham and St. Martins are to have departments of manual training this year.

The encouragement of home work in manual training is observed in several places. At Hudson, Massachusetts, the awarding of prizes for the best home work in manual training, done during vacation, was an incident of the September exhibit. A kite tournament with prizes, was a feature of the Boone County fair.

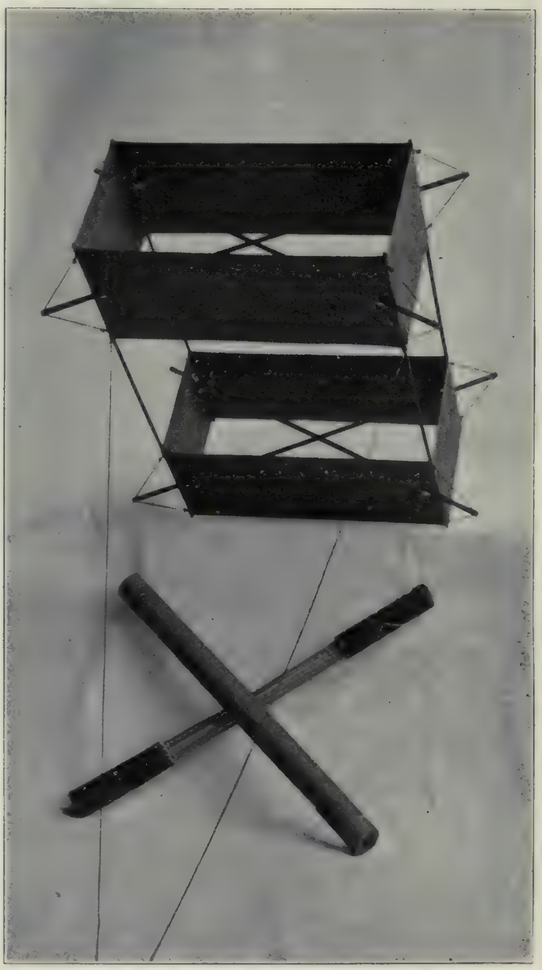
The alumni of the manual training school of Washington University, St. Louis, Mo., honored the founders of the school at their annual banquet, June 9th. A silver loving-cup was presented to Samuel Cupples, and in honor of Calvin M. Woodward, resolutions were adopted, asking the authorities of the school to restore his name to the catalog with the title of "Director Emeritus."

Louis A. Bacon, for ten years supervisor of elementary manual training in Indianapolis, Indiana, has resigned to accept a position with the firm of Atkinson, Mentzer and Grover. Mr. Bacon has been very active in association work and has made hosts of friends among the teachers of manual arts thru his good fellowship. Mr. Bacon has also been identified for several seasons with summer school work at Cornell University and the University of Illinois. We trust that the duties of his new position will permit him to keep in touch with manual arts work.

Harry E. Wood who has been in the manual training work in Indianapolis for several years has been appointed to succeed Mr. Bacon as director of manual training.

FURNITURE MADE IN GRAMMAR GRADE CLASSES, ALLEGHENY, PA.

Demonstration of actual work in manual training was a type of exhibit very common at the closing of schools this year. This should result in a better understanding of the value of manual training, domestic art and domestic science



A NEW DESIGN FOR A BOX KITE BY WILL G. CRAIG, SAGINAW, MICH.

among school patrons. In a great many places in addition to the regular exhibit of completed articles, boys were seen at work at the bench and girls at stove or sewing table. Cooking was done before the visitors, and lunches served. Every effort was made to show the work of the children in a practical way.

Allegheny, Pa., has a well organized manual training department in the public schools. Eleven ward schools are equipped for industrial work, and the high school manual training includes forging and pattern-making. The work is made as practical as possible; for example, certain first and second year high school students this year made work-benches and drafting-tables. Much attention is given to drafting, each school having a well-equipped drafting room. Students are required to make for each problem, first, a free hand drawing, and then a complete working drawing. Allegheny has tried to secure a broad view of methods of instruction in manual training by engaging teachers from the best institutions in various sections of the country, such as Pratt Institute, Stout Institute, Columbia University, and others.

In Butte, Montana, a new machine-shop has been added to the manual training department, costing between $8,000 and $10,000. This machine-shop completes the high school scheme of manual training which already included the following courses with suitable equipment; Mechanical drawing, beginning and advanced shopwork in wood, wood-turning, foundry practice, pattern-making, and forging. In these classes the pupils' work is checked by means of time cards. These cards also serve to give a pupil a sense of responsibility, incidentally helping to initiate the student into shop methods. The latter, however, was not the aim in view in adopting them. Manual training is also taught in the sixth, seventh, and eighth grades, in four centers, by three teachers. There are four assistants in this department in the high school. Carl E. Warner is director.

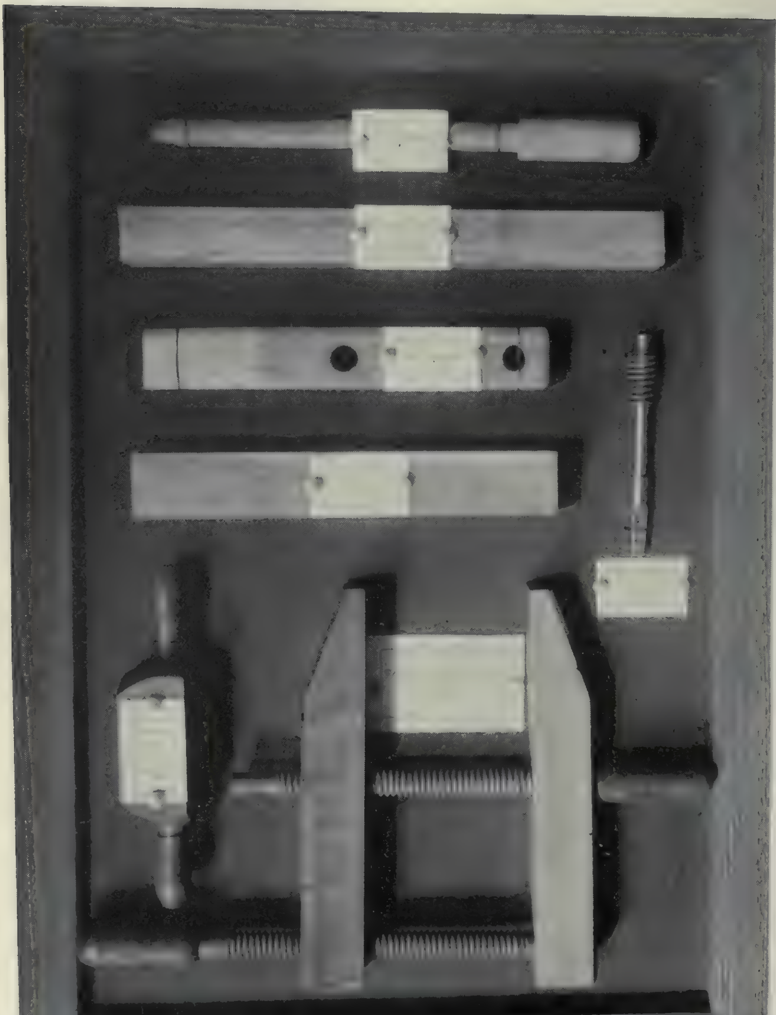
Helena, Montana, has a new building for the teaching of home economics in the upper grammar grades and high school.

From the south comes news of new schools in Tennessee and Texas. In Memphis the construction of a building for manual training was begun in June. It will be ready in October and will be one story high, costing $38,000. John W. Curtis, of Helena, Montana, takes charge of the work in Memphis.

Manual training and domestic economy will be introduced into the Chattanooga schools this year by W. R. Lockwood, a former instructor of manual training in Eau Claire, Wisconsin, and Columbus, Ohio.

Navasota, Texas, will also have a new building ready this month.

Extension of manual training into the rural schools is a growing movement. Changed conditions on the farm have made the work as desirable for country children as for city children. There is a feeling that more boys might be induced to remain on the farm thru the medium of manual training work which fosters a respect for hand labor and trains in manual dexterity. Kansas has her first rural school department of manual training in the new Shawnee county school,



MAKING A HANDSCREW—A WOODWORKING PROBLEM USED IN ALLEGHENY, PA.

District No. 78. From Delaware, also, comes a report of the success of the work in the Richlandton school, where a sixteen weeks' course in manual training was completed in June. The exhibit attracted the critical attention of trustees and rural teachers, who were most favorably impressed with the possibilities of the work in rural schools.

A number of localities in the eastern states have new schools, departments, or added courses in manual training. Philadelphia has a new Central manual training high school planned; $200,000 being set aside and a site selected. Danvers, Massachusetts, has $1,000 available for improvements. Lathes, band-saws, drills, and more benches will be added to the equipment. Waterbury, Connecticut, will be able to enlarge manual training facilities, owing to a trust fund of $125,000, left to the city for such purposes by the late Elisha Leavenworth. Nashua, New Hampshire, and Tilton Seminary, Manchester, N. H., will have manual training this year. The Crompton and Arctic schools of Pawtucket Valley, R. I., and Williamsville and Oswego, N. Y., will also have such departments.

Vacation schools have been in operation in many states. The courses which seem to be most popular in these schools are manual training, domestic science, and domestic art. Some pupils have also attended trade schools during the summer where such schools were available. Good attendance and deep interest in the vacation schools are reported from Portland, Oregon; Hibbing and Minneapolis, Minnesota; Medfield, Springfield, and Lyon, Massachusetts; and New Britain, Connecticut.

In one locality in Wisconsin, east of Lake Winnebago, an itinerant instructor has been employed to take charge of manual arts work in a circuit of four communities, New London, New Holstein, Chilton, and West DePere. The administration of the circuit will be in charge of the extension division of the University of Wisconsin, and the supervision of the course of study and instructor in charge of the department of manual arts. R. W. Hargrave has been appointed to this position as itinerant instructor.

As a result of a trial in the eighth grade the past year in Oklahoma City, Okla., manual training and domestic science will be extended thru the seventh grade, and in the near future, it is hoped, it will be extended thru all the grades. The work has met with the unqualified approval of the patrons.

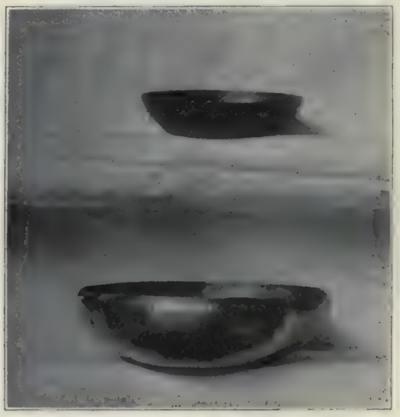
The schools of Fairbury, Nebraska, will have courses this year in manual training, domestic science, and business training. Miss Allie F. Skinner of Topeka, Kansas, is the domestic science teacher, and Harry Hogue, of Crete, has charge of the manual training work.

The manual training high school of Peoria, Ill., is to have added equipment to the value of $4,000. This will make possible a full four-years' course, including forging and machine-shop practice.

Two changes have been made in the manual arts and domestic economy departments at Michigan State Normal College at Ypsilanti. Mrs. Martha French, of Niagara Falls, N. Y., takes the place of Miss Stevenson as director of domestic art. Miss Stevenson was married June 21st. Carl Dorsey is to assist in manual arts. Miss Rena Angel, former assistant, expects to do graduate work at Columbia University.

At Racine, Wisconsin, classes in millinery and dressmaking for girls, and pattern-making for boys, have been added to the manual training course.

A manual training school will be built in Oshkosh, Wis., as a memorial to Orville Beach—the funds being a gift from the Beach family. The building will cost $65,000 and will be made of white Bedford stone. The courses of instruction will include all branches of manual arts and domestic economy.



COPPER AND BRASS BOWLS.

REVIEWS

ENGLISH BOOKS ON MANUAL TRAINING.

If one makes the effort to investigate the literature of manual training he is much surprised to find that there are such a large number of books published in England that are practically unknown in America. In this country we have known *Woodwork* by Barter, published by Whittaker & Co. from the time it was first isuued, and some of us have not known that there were any other books of consequence published in England. A few American teachers recall having seen Degerdon's *The Grammar of Woodwork* published by Macmillan, *Exercises in Woodworking* by Unwin, published by Longmans, *Manual Training* by George Ricks, published by Macmillan, and the Polytechnic Series of *Forty Lessons in Carpentry*. Perhaps, too, some are acquainted with *Hand-Craft* by J. D. Sutcliffe, a book of sloyd models published by Griffith in London, and one or more of the books on sloyd published by O. Newmann & Co. During the past few years they have perhaps become acquainted with *Educational Woodwork* by Horth published by Percival Marshall & Co. because an American edition of it has been issued by Spon and Chamberlain. In a similar way they have known *Woodwork for Schools on Scientific Lines* by Baily and Pollitt published in London by John Murray and in the United States by the Manual Arts Press. But as a matter of fact these are only the beginning of the list of English books on the subject. Indeed there are several of the earlier courses which we believe are almost wholly unknown even in American schools for training teachers. Some of these are of comparatively little value now, as courses to follow, but they are of historic value to the student; they help to broaden his outlook and sometimes they prove that certain "new ideas" are not new after all.

Perhaps the most interesting of these older books not mentioned above is *Manual Instruction: Woodwork* by J. Charles Pearson, formerly director of manual training in Liverpool, and Mr. Barter's co-worker in the first experiment with grammar grade classes in London. This book is published by George Philip & Son. It is surprising to see what a variety of problems are in this book. This book has no doubt influenced many later books. Others among the earlier courses were *Educational Woodwork* by Richard Trainor of the Manchester School of Technology published by the author; *Woodwork Course for Boys,* thirty models both joints and useful pieces, by William Nelson, at that time organizer of manual instruction for the Manchester School Board, published by George Philip & Son; and *Graduated Exercises in Woodwork,* mostly joints, by Oldershaw and Collis of Lincoln, published by John Heywood.

A few years later we find the character of the books changing. In 1901 Chapman and Hall published Richard Wake's extensive book entitled *The New Education: Manual Training Woodwork.* This was a volume of 360 pages outlining in considerable detail seventy-one lessons, giving attention to (a) subject matter, and (b) method. In 1903 O. Newmann & Co. brought out *The Woodwork Pupils' Illustrated Guide,* a unique book by C. W. D. Boxall of

Sheffield. This is not a course of study but a textbook of tools and their use, and as such has many excellent features. *Woodwork for Schools* by F. F. Lydon published by George Philip & Son is another book of about this same period. It is a course of thirty-six exercises and models designed to cover the Board of Education requirements for teachers in training. In 1906 Joseph H. Judd of Manchester completed his *Learn by Doing,* a Scheme of Simple Woodwork, which is having a marked effect upon English courses at the present time. His book was published by Clarkson and Griffiths of Manchester. Later Mr. Judd prepared 50 *Designs of Alternate Models* to supplement his "Learn by Doing." This was published by Hinchliffe & Co. of Manchester. Another and more recent book, which in some respects belongs in a different class, is *Principles of Educational Woodwork* by C. L. Binns and R. E. Marsden, published by J. M. Dent & Co. This book bears also the imprint of E. P. Dutton & Co. of New York. As is indicated by the title, this book occupies a new field. It well deserves the attention of American teachers as well as teachers in England.

—C. A. BENNETT.

Paper and Cardboard Construction. By George F. Buxton and Fred L. Curran of Stout Institute. The Menomonie Press, Menomonie, Wisconsin, 1911. 5 x 7¾ in., pp. 166 XIII; price $1.00.

We heartily welcome this book for the following reasons:

1—Every problem in the book is suited to the material used. This cannot be said of most books on the subject.

2—It excludes "unusual shapes, saw-toothed edges, highly colored floral decorations, inappropriate types of construction, over-complex forms, and other eccentricities."

3—It sets a high standard of draftsmanship.

4—The problems selected are within the pupils ability and his "sphere of interest."

5—It presents a sequence of work that leads to somewhere, instead of "nowhere," yet it is flexible enough to allow of indefinite variation and the introduction of problems not given in the book. It presents a high type of manual training course and is at the same time an excellent preparation for a vocational course in printing and bookbinding.

6—It insists that the teacher formulate her aim, and plan her course, and do the work with her own hands before she attempts to teach it to the children. It gives a great amount of detailed information of immediate practical value to the teacher, yet it expects the teacher to prepare each lesson. It is for live teachers and only such should be allowed to give instruction in paper and cardboard work (not to mention some other subjects).

7—It closes with a five-page bibliography, a well made index, and an appendix giving specimens of papers, accompanied by notes on the use of each and the sizes in which it can be purchased. Taken as a whole, this book lifts paper and cardboard work to a higher educational plane than it has occupied heretofore.

—C. A. B.

Special Report on Manual Training in Schools of General Education. By H. J. Bhabha M. A., Inspector-general of Education in Mysore. The Government Press, Bangalore, India, 6¼x10. pp. 145.

This report is the result of a tour of European countries and America undertaken with the purpose of investigating the subject of manual training in those countries. It is very comprehensive, containing chapters on the physiological basis of manual training, on the importance of manual training in the development of mind and character, on the relation of the subject to society, on the Mosely Commission, and discussions of manual training schools of all kinds in both America and England. One entire chapter is devoted to Hampton Institute. The book contains a history of the development of manual training, and the quoted opinions of all the leading educators and writers on the subject. Mr. Bhabha evidently wished, before introducing manual training in India to get at the subject from all points of view—hence the investigation was made with an open mind, resulting in a splendid collection of material which is wide in scope, thoro and unprejudiced in statement. Aside from the original intention, the book will be just the thing for the superintendent of schools who wishes to become well informed on the subject of manual training, and not dependent wholly on the possibly localized viewpoint of his supervisors of the subject. The book has a number of interesting illustrations. —V. E. WITHEY.

The Flush of the Dawn. Notes on Art Education. By Henry Turner Bailey. Atkinson, Mentzer and Grover. 6¼ x 9½ in.; pp. 115; illustrated; price $1.00.

This book is the work of a man who sees goodness and beauty in the world about him, and in mankind the image of the divine. He is an optimist, and his optimism is contagious; but the more contagious it becomes the better for human kind.

The book begins, like the school year, with the autumn, and carries the reader on thru the seasons and a summer vacation in Europe. Each month and between times the author has an appropriate message. In November, for example, he says, "On the first Sunday in November falls the feast of the Royal Oak. This venerable tree, with a trunk seven yards round, spreading its branches a full hundred feet, heaping its great hemisphere of leaves high over the walls of the wood and the hill which encompass it, has been famous hereabout since the dawn of our history. When the maples and the beeches are bare, when the elms and the birches have nothing to show but their traceries of twig, when the ash leaves have fallen and the white oak leaves have shriveled, this old monarch dons his robes of Tyrian purple and sits in state magnificent." Then he adds three pages on "Thanksgiving" that are worth three volumes. For the end of the year he tells the Christmas story in language so simple and beautiful that we doubt whether it has ever been equalled for children, or even grown-ups who have not lost more than they have gained in their growing up.

After the new year the beauties of the midwinter are told in a word sketch so graphic and so full of the witchery of the season as to hold one back to re-read and read again before he can go on—especially if he were born in New

England. In fact, the book is made up of choice editorial paragraphs—writings that have appeared from time to time in the School Arts Book. Taken together and with the frontispiece of the dawn in full color, they bring a new message of uplift to the teacher of the manual arts.

In this book Mr. Bailey invites us to his own fireside. He tells us of his boyhood acquaintance with all the furry tribe that inhabited "Reedfarm;" he reveals to us his appreciation of poetry and his passion for flowers and the ocean. We see him romping with his children and climbing the tower of his castle to paint the "ascending of the morning." Very much of the charm of the book lies in these personal touches. They serve to give a glow of reality to what might otherwise remain in the realm of theory.

Thruout the book there is a happy bouyancy and a sure faith in the possibilities of human refinement thru the study of the beautiful in art and in nature. —C. A. Bennett.

Camping for Boys. By H. W. Gibson. Published by the Association Press, New York, 1911; 5x7 in.; pp. 294.

For boys who are fortunate enough to have a summer outing in camp, but more especially for the men who assume the responsibilities and do the planning for camping parties, this book has been prepared. It constitutes a complete and authoritative guide, covering the entire field from a discussion of the purpose of camping, to educational activities and rainy day games—from camp equipment, organization, administration, and discipline, to camp hygiene and sanitation and simple remedies—twenty-three chapters in all, with many illustrations, and an index.

The book is written by a man who has had many years' experience in camping with boys, and who evidently knows the problems and the solutions for most of them. There are very few camps where this book would be found superfluous; and with it as a guide a group of boys, with one or more men, would be inspired to embark upon even their first camping expedition with confidence. —William T. Bawden,
University of Illinois.

Nature Drawing, from Various Points of View. Edited by Henry Turner Bailey. Atkinson, Mentzer, and Grover, 6¼x9¼; pp. 161.

This is a reprint in book form of articles published originally in the School Arts Book. The teacher of drawing will find this book practical, stimulating, and suggestive—indeed indispensable. To the teacher who is already familiar with the articles, the collection in convenient form will be most welcome. There are seventeen chapters, six of which are by Mr. Bailey, and these are the cream of the book. The other articles are by people of authority in the world of art teachers and present interesting points of view. There are six fine color-plates increasing the beauty of the volume, and many illustrations, not all of which seem worthy of the text they accompany. Possibly it could not be expected that all should maintain the high standard set by the illustrations of Mr. Bailey's articles and the article on "Analytical Drawing of Plants," a translation from the French. The book will appeal in many ways to the decorative designer as well as to teachers. —V. E. Withey.

The Teaching of Manual Arts. By Fred D. Crawshaw and Robert W. Selvidge. High School Bulletin No. 11, issued by the University of Wisconsin, Madison, Wis.; pp. 122. This bulletin gives much material needed at the present time by high school principals and superintendents as well as by teachers of manual training. It discusses educational values, the relationship between the manual arts and industrial processes, organization and administration of the manual arts, etc., and gives outlines of courses of study. At the end of the volume is a brief historical review of the manual arts movement in America and a chapter on the development of manual arts in the schools of the state of Wisconsin.

Machine Shop Primer. By Fred H. Calvin and Frank A. Stanley. McGraw-Hill Book Co. 1910. 6¼x9½ in.; pp. 148; price $1.00. This book is in three sections. The first contains 508 carefully made outline drawings of machines, tools, and machine-shop appliances. The second of nine pages gives the names of the illustrations in section one. Section three is a dictionary of shop terms. All the illustrations in section one have reference numbers in section three. It is a convenient reference book for students in machine-shop work.

American Art Manual, 1910-1911. Edited by Florence N. Levy, 215 West 57th St., New York, N. Y. 6x9 in.; pp. 488 plus 62 plates.

This is a commendable piece of work. It contains a great amount of statistical matter concerning schools of art, courses, artists, societies, writers and lecturers on art, galleries, art dealers, and paintings sold at auction. The plates are half-tone engravings of school buildings, paintings, works of sculpture and a great variety of craft work.

Spring Flowers. A New Nature Packet. By James Hall. Atkinson, Mentzer, and Grover, 10x12, 11 plates. Price $0.75.

These plates in color will serve as ideal standards for children's work in drawing. They are simple and suited to the various grades. There is a sheet of explanatory text for the teacher's use.

RECEIVED

Report of Public Schools of Glen Falls, N. Y. This contains a report by the teacher of manual training, S. Horace Williams, and several full-page plates of furniture which appear to be excellent in every way. One of the plates shows coping-saw work.

Forests of New York. Compiled by George Martin Wiley. The Arbor Day Annual for 1911 published by the New York State Education Department. It treats of the forests of the state, the lumber industry and gives extracts from governors' papers referring to the forests of the state. One chapter is given to the development of European Forestry, another to selected poems relating to the forest. At the end is a reference list on forestry books. It is printed on fine paper and illustrated with some choice photographs. It is a beautiful booklet.

Principles of Jelly Making. By N. E. Goldthwaite. University of Illinois Bulletin, Vol. VIII, No. VII. Urbana, Ill.

Some Points in Choosing Textiles. By Charlotte M. Gibbs, University of Illinois Bulletin, Vol. VIII, No. XV. Urbana, Ill.

Regulations and Syllabus, 1911, Educational Handwork Association, England. Published by John Murray, London. Price 8d.

Official Bulletin of Recognized High Schools, 1911. Issued by the Ohio State Department of Education. Discusses the Vocational Movement in Ohio.

American Schoolhouses. By Fletcher B. Dressler. United States Bureau of Education, Bulletin, 1910, No. 5. Contains 267 plates.

Oklahoma Manual Arts Association. First Annual Report. L. P. Whitcomb, Secretary, Weatherford, Okla.

The Illinois Manual Arts Association. Proceedings of the Eighth Annual Meeting. A. C. Newell, secretary, Illinois State Normal University, Normal, Ill. Price 10 cents. Contains outlines of courses of study recommended by the Association.

Courses in Mechanical and Freehand Drawing. Bulletin No. 32, 1910, issued by the Bureau of Education, Manila, P. I. Frank R. White, Director of Education. For use in trade and intermediate schools.

State Museum. Division of Education. Harrisburg, Pa. Alicia M. Zierden, Curator. Devotes some space to manual training, technical education, social economy.

MADE BY HIGH SCHOOL PUPIL AT ILLINOIS STATE NORMAL UNIVERSITY.

VOLUME XIII NUMBER 2

MANUAL TRAINING MAGAZINE

DECEMBER, 1911

THE SCHOOL SHOP AND THE CHRISTMAS SPIRIT.

LEONARD W. WAHLSTROM.

THE making of Christmas gifts is an established feature in most of our manual training shops, either as definitely planned class work or as voluntary work by the pupil on outside time. Sometimes this work is planned and dictated by the teacher, sometimes planned by the pupil. This work to be of the greatest value must be laden with emotions and feelings, the depth of which can only be measured by those actually concerned, namely, the pupil, the teacher, and the one for whom the gift is intended. Frequently, an object which represents the greatest amount of thought and feeling on the part of the pupil will be crude in execution. On the other hand, it often happens that a beautifully designed piece of work may be executed under the teacher's dictation without regard to individuality, and be utterly cold and barren as regards emotion. We must not lose sight of the fact that, "the gift without the giver is bare." An article upon which a child has bestowed much loving care and thought, and which has been worked out with painstaking effort—every tool mark representing an act of devotion and love, is well worthy of grateful acceptance, even tho crude.

Often, however, we see pupils working under stress in the shop on some gift, where the motives may be doubtful Eagerness for praise from a fond parent is often the incentive to this hasty effort. The parent, with little knowledge of the child's true ability, often accepts an article of mediocre merit. The child receives praise and credit for an effort

FIG. 1. SOME OF THE HAPPY WORKERS IN SANTA CLAUS REPAIR SHOP.

which he knows is slightingly and hurriedly performed, and which is not worthy of the praise bestowed.

The first type of work mentioned we recognize as good, and has a very definite place in our work. Work of the latter type, however, is a result of the spirit of Christmas as it has been allowed to degenerate,

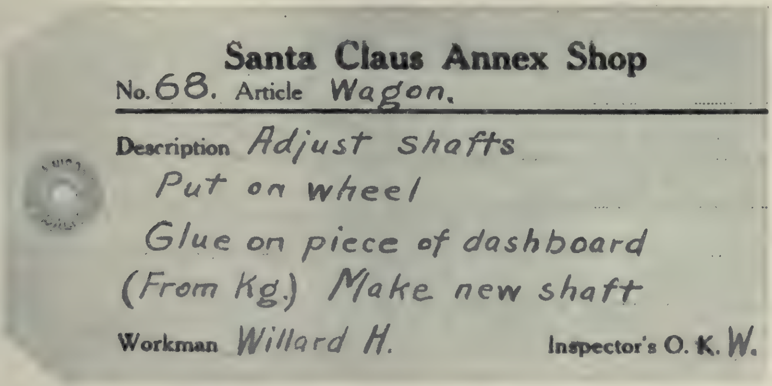

Santa Claus Annex Shop
No. 68. Article Wagon.
Description Adjust shafts
Put on wheel
Glue on piece of dashboard
(From Kg.) Make new shaft
Workman Willard H. Inspector's O. K. W.

FIG. 2. JOB NUMBER AND REPAIR TICKET.

and develop into a time of promiscuous giving and receiving of gifts. This is emphasized in other ways, as, for instance, by our inhuman burdening of shop girls and sales people with our "eleventh hour" purchases, and by the Christmas-day loads of the mail carriers.

The following plan has been worked out as a means of developing a broader spirit of Christmas among children—dealing with altruistic motives rather than selfish and personal, and using cooperative rather than individual methods. At the same time we have utilized the play element by introducing the favorite character of Christmas, Santa Claus.

In every household, in which there are or have been children, there are countless toys, dolls, books, and games in various stages of dissolution and repair. Many of these have outlived their usefulness in that particular household, but with the addition of a little spare time and ingenuity, together with a touch of color to brighten them up, they would still make most acceptable Christmas gifts to many a child in poorer circumstances.

To utilize this repair work as a feature of our manual training we established a Santa Claus annex shop.

SANTA CLAUS ANNEX SHOP.

Announcement was made to the children and notice sent to the parents, that the school would be ready to repair and put in good condition such toys as could be sent in, these toys to be sent to settlements in more needy parts of the city for distribution.

The next step was to present the scheme to the pupils in an assembly of the whole school. Upon reaching school in the morning, the pupils were confronted with the following notice prominently displayed on posters in the main hall:

WANTED——AT ONCE——WANTED

Wanted at once—workers in the following trades:

25 MECHANICS—Must have a good knowledge of auto repair work, aerial machines, boats, engines—both stationary and locomotive,—clockwork motors, agricultural implements, wagon repair work, etc., etc., etc.

20 PAINTERS—Good at retouching; must have experience in mixing and judging colors and be able to handle brushes well.

20 SURGEONS (in hospital)—Skill especially needed in grafting arms and legs and replacing heads. Those with previous experience along these lines in either hospital or private practice preferred.

10 VETERINARY SURGEONS—A good knowledge of the anatomy of teddy bears, dogs and horses is necessary.

10 BOOK REPAIR MEN—Neat, careful workers, able to handle needle and paste brush.

10 REPAIR MEN FOR GAME DEPARTMENT—Must know how to figure out the rules.

20 WRAPPERS AND PACKERS—Wanted for packing and shipping department. Only neat workers need apply.

1 FOREMAN AND INSPECTOR WANTED..In each of the above departments. Only the most competent need apply. A personal interview with the Superintendent desired.

Applications may be made in person or in writing. Steady work promised from now until December 20th. GOOD WAGES. GOOD HOURS.

(Signed) SANTA CLAUS.

P. S.—This is my busy season. I have appointed Mr. Wahlstrom, superintendent of my Annex Shop at the Francis W. Parker School. Particulars may be obtained from him or from any of the class teachers in said school. Applications should be in by December 1st.

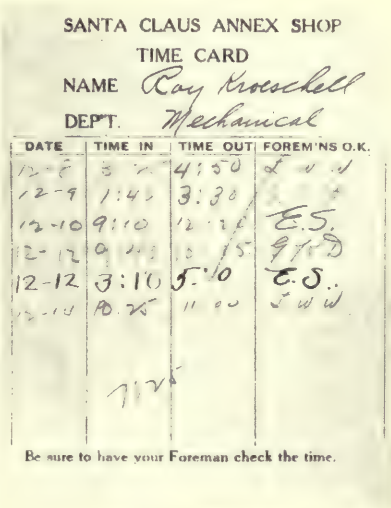
Later, at the morning exercises, when the whole school was assembled, the scheme was presented to the pupils. Toys, which had already begun to come in, were displayed and large charts of the printed blanks which were to be used were hung at the front of the room.

These blanks were later printed by the boys of the printing class, on the school press.

The plan presented was to organize the work in a systematic way—on a factory basis, dividing the work into the following departments:

Mechanical repair department, Painting, Doll repair department (hospital), Book department (for repair), Game department, Wrapping and packing department.

Each of these departments was presided over by a larger boy or a teacher as foreman and inspector. In each department the many things to be done were classified. This plan furnished a wide range of processes in many varied materials and a splendid outlet for the ability and ingenuity of many pupils from the first and second grades up to the eighth grade and high school. These processes varied in difficulty from mending cardboard boxes, pasting labels, repainting scuffed and battered toys, to simple soldering and tinsmithing, repairing clockwork locomotives, steam engines, etc. See Fig. 1.


SANTA CLAUS ANNEX SHOP

TIME CARD

NAME Roy Kroeschell

DEPT. Mechanical

DATE	TIME IN	TIME OUT	FOREM'NS O.K.
[illegible]	[illegible]	4:50	[illegible]
12-9	1:45	3:30	[illegible]
12-10	9:10	[illegible]	E.S.
12-11	[illegible]	[illegible]	[illegible]
12-12	3:10	5:10	E.S.
[illegible]	[illegible]	[illegible]	[illegible]

Be sure to have your Foreman check the time.

FIG. 3. TIME CARD.

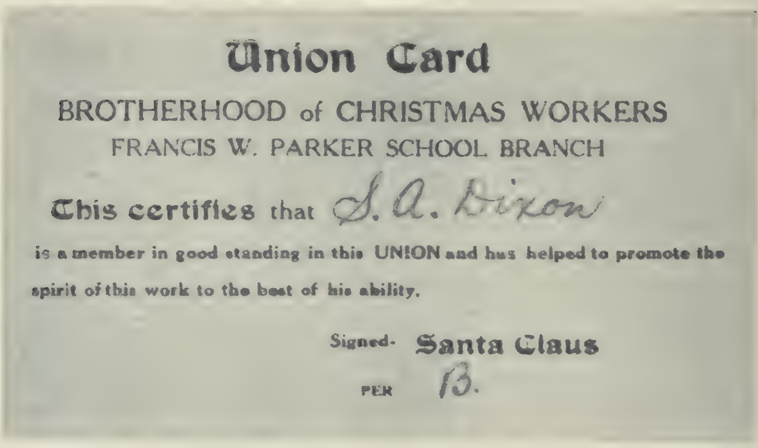
Two afternoons per week, after school, were devoted to this work. In addition to this pupils were allowed to give other spare time, and in some cases where a class had finished the regular manual training for the term, the class time was devoted to the work.

When the toys were brought to the school they were taken to the "Receiving Department." Here they were sorted and sent to the various departments mentioned above. They were next gone over by the inspector and foreman in charge of the department and a card made out as follows: The card showed the job number and the repairs necessary to put the article in presentable shape. It was attached to the article and it was now ready for the workman—due regard being given to selecting jobs within the ability of the pupil. See Fig. 2.

When a pupil took a position in a department, and agreed to give

two afternoons per week to the work he was given a time card. See Fig. 3.

After satisfactory work of a week's time a "Union Card" is the next step, for Santa believes in unions altho he has not succeeded in



Union Card

BROTHERHOOD of CHRISTMAS WORKERS

FRANCIS W. PARKER SCHOOL BRANCH

This certifies that S. A. Dixon

is a member in good standing in this UNION and has helped to promote the spirit of this work to the best of his ability.

Signed- Santa Claus

PER B.

FIG. 4. UNION CARD.

unionizing the whole world and reducing the hours of all of his holiday assistants. This puts the stamp of approval on the pupil for his efforts. See Fig. 4.

So far we have dealt only with repair jobs. The number of such toys will no doubt vary in different localities. When the first appeal is made attics and storerooms will be ransacked and the accumulations of years, possibly, sent in. So when the next Christmas appears, the quantity would probably not be so great. This however need be no drawback. Attention could well be turned to manufacturing toys, such as doll's beds, tables, chairs, games, etc., holding to the same factory basis and subdivision of labor. Our point of view here is different from that of the regular workroom, in that we have our mind on the product. Thus we would assign a pupil to a certain process which he was able to do well and which he would improve thru repetition. It would also be well to introduce labor saving devices, templates, etc., to increase efficiency of worker.

Finally, the pay. We as teachers can already see many tangible results to the child from this practical form of manual training, but this is an institution which believes in good wages, and pays by check. That this kind of service is a healthy occupation, not in the "extra-hazardous"

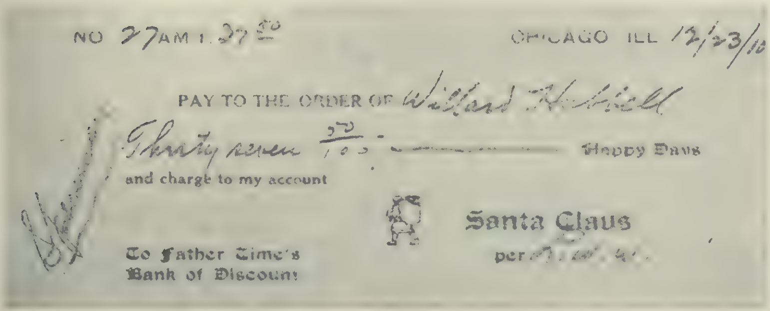


FIG. 5. PAY CHECK.

class, we have only to note the healthy, happy countenance of the head of the institution as he appears each Christmas on his annual round.

So, when the time cards are turned in, a check on Father Time's Bank of Discount is made payable to the happy young worker, the wages being based on the rate of five "Happy Days" of additional life, per hour. These checks are good for their full value and will be redeemed by old Father Time without protest. See Fig. 5.

The value of this work was manifest in many ways. Most noticeable was the feeling of good fellowship which pervaded the work. The kindly and sympathetic interest of the older boys, who filled the role of inspectors and foremen, in the struggles of the younger people in some difficult piece of repair work, helped to unite the older and younger members of the school. High school boys "renewed their youth" and also discovered interesting applications of their recent physics experiments while investigating the "innards" of some mechanical toy. The children of the primary grades were busy with paste pot and shears, and it would be hard indeed to recognize in the gay and festive results of their labors, the commonplace cardboard boxes which had been brought in for packing the completed work. The older girls delighted

FIG. 7. PART OF THE PRODUCT OF THE SANTA CLAUS REPAIR SHOP.

in sewing doll's clothes so that each of the dolls that went out would have a new outfit. Fig. 6.

Altho there was a spirit of play in the work it was interesting to note the seriousness with which the pupils entered into it. The lengthening column of figures on the time card was eagerly watched, and the pay check at the end was as highly prized as tho it represented actual cash. The value of industrial organization and subdivision of labor was appreciated by even the youngest workers. And underneath it all was the joyful spirit of Christmas, the knowledge that the work was a labor of love, in order that someone less fortunate might have his share of Christmas joy. Fig. 7.

FIG. 6. ONCE "SANS EYES, SANS EVERYTHING," BUT RESTORED TO FURTHER USEFULNESS.

A quotation from somewhere comes to my mind. It runs as follows:

> Boys in Holland love to make
> What boys in England love to break.

I can not vouch for the justice of this quotation to the boys mentioned, but let us hope that *our* boys will not develop the latter form of love, but rather an ability and a desire to mend, when broken; together with a willingness to devote a part of their energies and time for their less fortunate fellows.

A STUDY IN CONCRETE CONSTRUCTION.[1]

ALBERT F. SIEPERT.

MANY materials have found a place in the different lines of handwork developed in the course of various school systems. Some, like bent iron, have been overdone, have failed in a degree at least, and only what was worth saving remains. Others have been more suitable or more properly handled, as wood for instance, which is perhaps the most commonly used thruout the country as a medium for grammar grade shopwork. Wood is, however, becoming a high-priced article and consequently is not being used in the manner that it formerly was.

Within recent years a material has come into such extensive use in building construction that there is practically no section of the country that can not show some examples of it. Concrete, in some form or other, was used centuries ago, yet it has remained for the present time to bring us face to face with its possibilities. Its uses are legion and space forbids more than a fleeting glimpse. From aqueducts to flag-poles, from statuary to fortifications, from dog-kennels to skyscrapers—everywhere intelligently used concrete has met the demands made upon it. However, we have not yet realized how great will be the effect of this material upon the future.

When one reads or hears the name of Edison, the first thought that comes is 'electricity,' yet among his many inventions he has found it worth while to study concrete construction and to devise means which will help to solve the problem of a house for the family of moderate means. If successful—and Mr. Edison's career would lead one to take that for granted—his invention will give us, for example, a six-room house whose initial cost will be low enough to enable a man with an annual income of $550, to own or rent it. Such houses can be made beautiful, they will be comfortable and permanent. The owner will be free from bills for repairs, insurance—what a future the Age of Concrete promises!

The wide-awake teacher of manual training is, and must be, ever on the lookout if he would make his work of the most value to his pupils, and so in a larger way, to the community. What he teaches and how he teaches it will depend upon how correctly he has found out the needs

of his classes. It is not strange, then, that so many materials and methods have been and are being tried.

Among the industries available for study in schoolwork, concrete construction is comparatively new, and deserves special mention. Very few schools have thus far worked out courses, but where experiments have been made teachers are enthusiastic in its support. Whatever may be its place somewhere in a boy's training is only a matter of speculation as yet. The success or failure in the schools where it is being tried will go far to determine how much of it is really worth while.

The subject may be treated in many ways, of which the following pages indicate but one. For convenience, the field was divided into several parts under appropriate headings. The "informational" deals with the material and methods of handling it; this includes something of its use in the past, its relation to modern life, a study of the decorative side, etc. The "doing" side covers the actual working out of a number of typical problems. The former was acquired by class talks, discussions, and outside reading: the latter was done in the regular shop work period.

A STUDY OF THE MATERIAL AS TO INGREDIENTS.

Concrete is a mixture of cement, sand, gravel, and water. Theoretically, the cement fills the voids between the particles of sand, this mixture fills the voids between the pieces of gravel. The water (1) brings the whole into a compact mass causing each particle of sand and gravel to be covered by a film of cement, and (2) causes the cement to "set" or harden, making the whole mass one stone. To get a better idea of these ingredients they must be studied separately and in some detail. Cement is considered first because it is the more important. Sand, gravel, and water come next, and then a brief survey of other materials which may be used.

Cement has a long history. It was used in some form or other, by the Egyptians, Peruvians, and Mexicans of ancient times. The best example of its use by the Romans is the dome of the Pantheon, built by Agrippa in the year 27 B. C. This concrete was a mixture of lime, volcanic dust, sand, and broken stone. It produced an artificial stone strong enough to endure to the present age. The cement in use in medieval times and even down to the nineteenth century, was what is known as natural cement, that is, it was the product made from cement

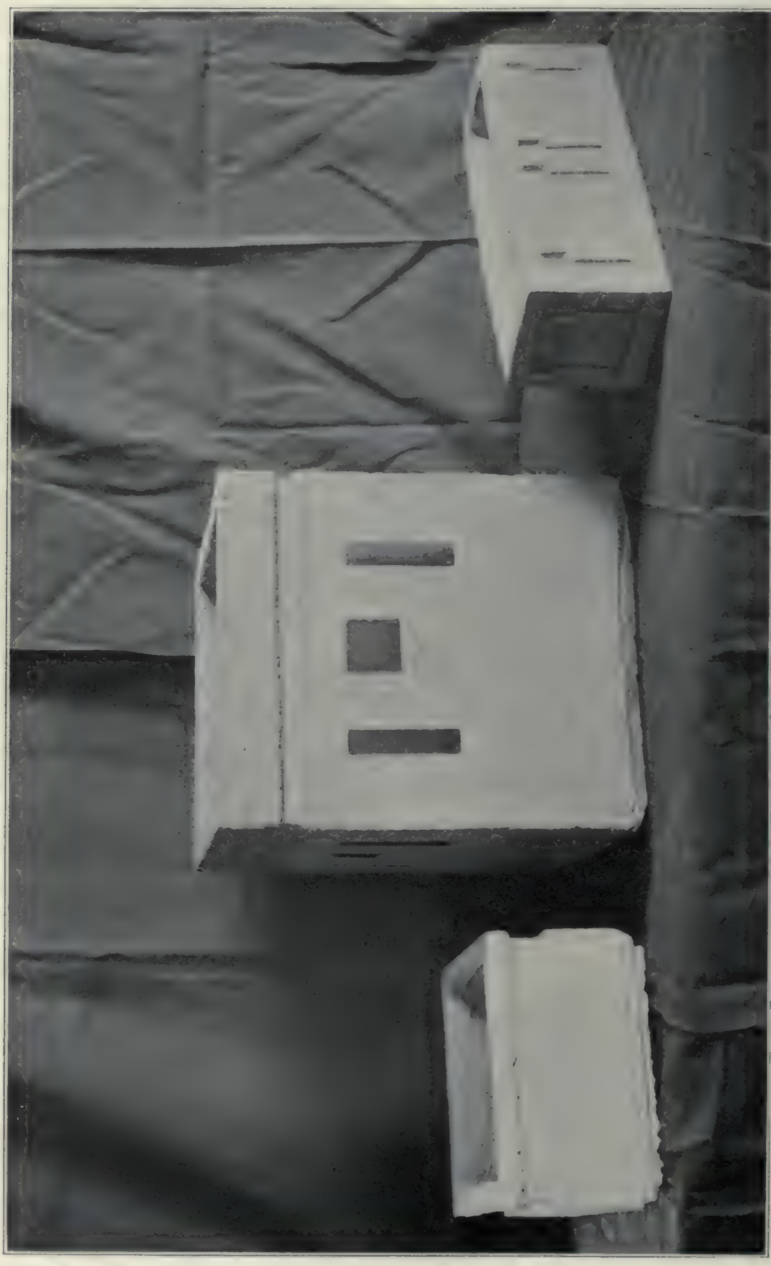


FIG. 1. GARDEN JAR AND FLOWER BOXES, DECORATED WITH INCISED LINES AND INLAID TILE.

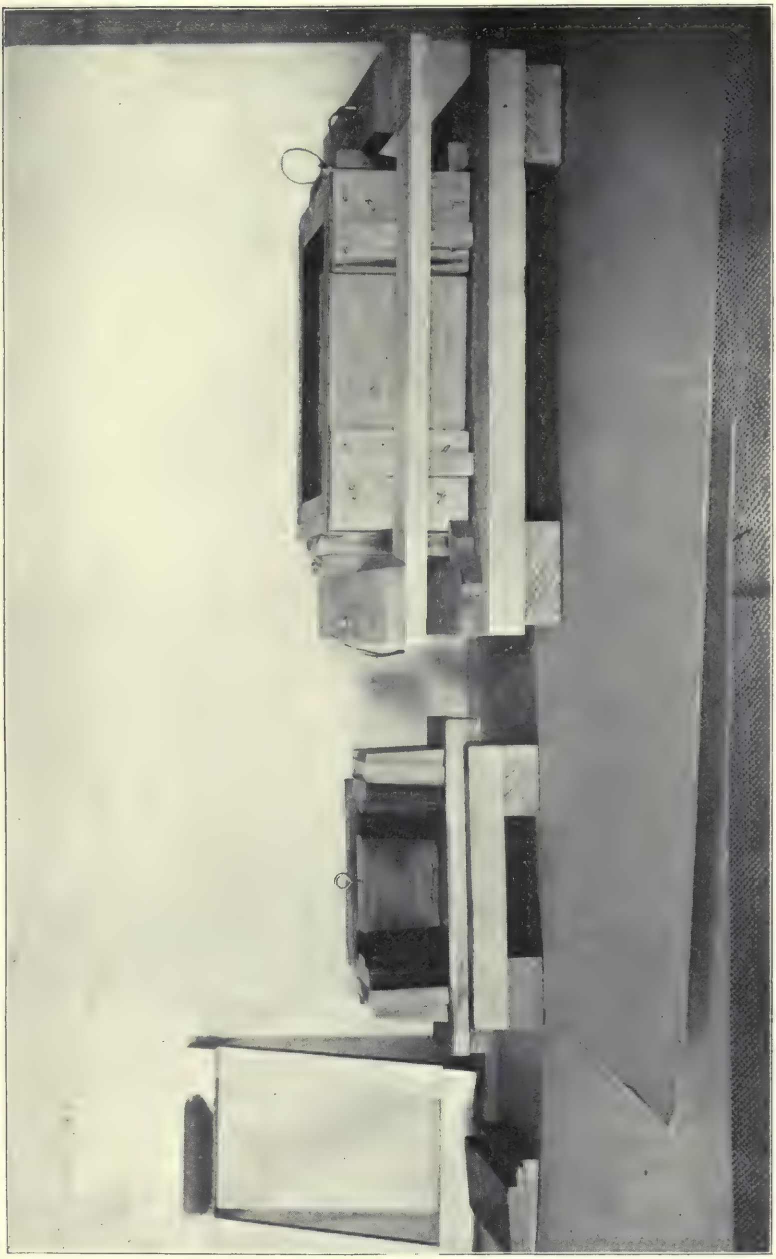


FIG. 2. FORM (ON THE LEFT), FOR MODEL HOLLOW CONCRETE BLOCK, WITH ONE SIDE REMOVED TO SHOW CORE. THE RECTANGULAR FRAME HOLDS ALL PIECES IN PLACE WHEN IN USE. FORM (ON THE RIGHT), FOR FLOWER-BOX, ASSEMBLED READY TO RECEIVE THE CONCRETE.

Copyright by Cheshire L. Boone

rock, or similar material in the proportions in which it exists in nature. About one hundred years ago French and German scientists began a serious study of cement manufacture, which resulted in the first artificial hydraulic cement. In 1824, a patent, the process of making Portland Cement, was granted to Joseph Aspdin, an Englishman. He gave his cement the name by which it has since been known because its color resembled that of a limestone secured from the Isle of Portland. The first importation to the United States was made in 1865. Imports increased steadily, reaching their highest mark of three millions of barrels in 1896. The American mills began to come into their own about this time, and wonderful progress was made in the improvement of quality as well as in the increased production. One million barrels were made in 1896, and twelve years later, 1908, that figure was exceeded by fifty millions of barrels.

Portland cement is a very fine, grey powder, which is sold in bags or barrels. A variety of substances may be used in its manufacture, but the two essential things are a carbonate and silicate. Sometimes these exist in practically the right proportions in rock formations know as cement rock. When so used, the product is known as natural cement. More often cement rock is used with limestone, or limestone and clay in the proportions of three of limestone (carbonate), to one of the clay (silicate). This proportion is maintained constant by making frequent tests while the process of manufacturing is going on. Cement rock is found in New York, Pennsylvania, and Kentucky. Limestone is more common so the cement manufacturing industry exists in many places.

THE PROCESS OF MAKING CEMENT.

The rock is blasted in the quarries, loaded on flat cars and taken to a rock crusher. The crushed stone goes thru a process of grinding which finally reduces it to a fine powder. This powder is tested frequently to insure proper proportions. Having been ground to a fineness which will permit at least 90% to pass a No. 200 sieve, this "composition," as it is called, is ready for firing. This is done in great kilns from 5 to 8 feet in diameter and 100 or more feet in length. A sufficient amount of powdered coal is fed into the kilns along with the composition to raise the temperature to about 3000 degrees F., which causes the formation of a rough, porous stone called "cement clinker." This clinker is crushed and ground to the same degree of fineness as that of composition. This cement is now stored in tanks or warehouses

for "seasoning," after which it is packed in bags or barrels and sold for use.

The characteristic thing about cement is that it readily absorbs water either by direct contact or from the air, and as soon as it does this, it begins to "set" or harden. This action takes place but once,

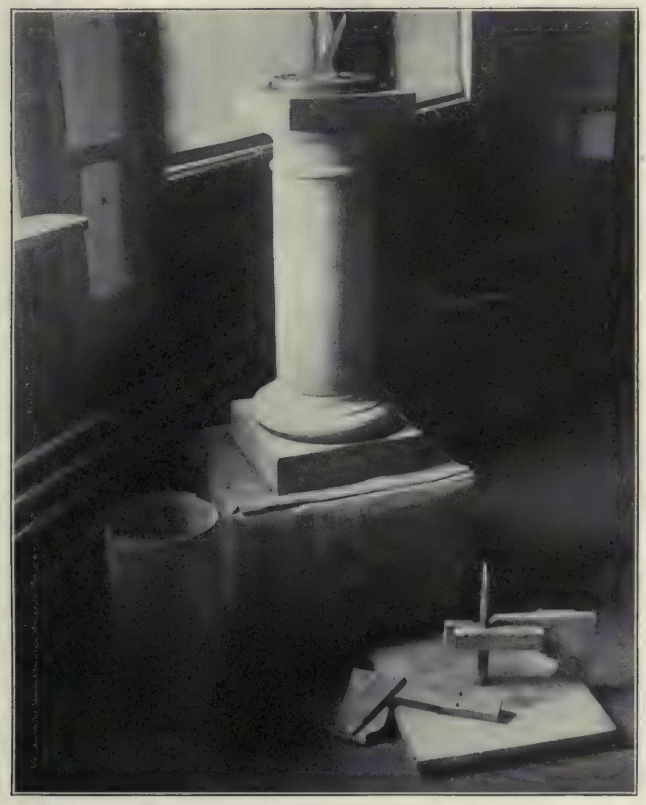


FIG. 3. SUNDIAL, MOLD FOR COLUMN, AND APPARATUS FOR SWEEPING UP CAP AND BASE PIECES. COURTESY OF EDWIN F. JUDD.

beginning about an hour after being mixed with water and continuing until the process of crystallization is complete. Time only makes it harder and stronger. Hence cement must be stored in dry places, and when once wet, used immediately.

The second factor in good concrete is sand or "fine aggregate." This must be clean, i. e., free from vegetable loam. The size of particles is determined by local conditions and nature of the work done.

The larger the particles the coarser and stronger the concrete, while fine particles give smoother but weaker results.

Loam can be detected by rubbing some of the sand in the palm of the hand where it will be indicated by a sticky film. Another method is to put a small quantity of the sand in a bottle, cover with water and shake. If the water becomes dirty it shows loam or clay. The exact proportion can be determined by allowing all to settle. There will be a layer of sand, a film of loam, clay or other foreign matter, and lastly, the clear water. For construction work sand is washed which has 5% or more of such impurities.

Sand can be readily cleaned by washing. Make an inclined trough having a wire bottom—30 meshes to the square inch—and wash the sand down from the upper to the lower end by water from a hose or poured from a bucket. Loam, etc., will all be washed out before it gets there.

The third material used in making concrete is gravel or broken stone. This is known as the "coarse aggregate." Natural gravel is much to be desired for ornamental effects; it may need cleaning just as does sand. Broken or crushed stone is more often available and is very efficient. Particles may vary in size from dust to pieces about 2½ inches in diameter. The nature of the work determines the size to be used. Uniformity is secured where desired by screening. Cinders, slag or broken brick are often used with or in place of gravel. Such concrete is not as strong but does very well when properly used.

Water is the great agent needed to bring about the change which takes place in the setting of concrete. Clean, fresh water is essential. Water holding refuse in solution, salts, acids, or alkalis, makes inferior concrete in proportion to amount of impurities present.

A STUDY OF CONCRETE AS TO PROPORTIONS OF INGREDIENTS.

Concrete has found a place in many varieties of construction work, and as the requirements vary so it has been found advisable to use various proportions of its ingredients. The factors which largely determine these proportions are,—required strength, density, economy, etc. Four mixtures are most commonly used,—

a. "Rich" mixture, Cement 1, Sand 1½, Gravel, etc., 3.
b. "Standard" mixture, Cement 1, Sand 2, Gravel etc., 4.
c. "Medium" mixture, Cement 1, Sand 2½, Gravel etc. 5.
d. "Lean" mixture, Cement 1, Sand 3, Gravel etc. 6.

a, is used for water tight utensils, high stresses, etc.
b, is used for floors, machinery foundations, etc.

c, is used for retaining walls, sidewalks, etc.
d, is used for heavy walls, stationary loads, etc.

The amount of water used likewise varies to meet different conditions. Three consistencies or mixtures are in general use, as follows,—

a. "Wet"—a concrete thin enough to run readily.
b. "Medium"—jellylike, just too soft to bear a man's weight.
c. "Dry"—a consistency similar to molding sand used in the foundry.

A concrete so thin that it will run into and readily fill parts of the form is required for work involving thin sections, fine details, etc. A medium mixture is used for average jobs which can be tamped to insure the removal of a "pocket" or open spaces. Concrete pottery of certain kinds, foundations, etc., often require the use of a dry mixture. The wetter the mixture the less tamping required in placing to remove pockets, but the longer time needed for setting, and vice versa, the dry mixture demands more care in placing but takes less time to set up. In short, ease in placing and time available for setting largely determine how much water shall be used. Consistencies are to be experimented with until the right amount of water is used and after that no variation need occur.

MIXING THE CONCRETE.

Concrete is mixed mechanically for all jobs of considerable size. Mixing plants vary in size from the small handpower mixers with a capacity of from two or three cubic feet, up to machines run by steam, electric or gasoline engine power, having a capacity of a cubic yard or more. Such methods are beyond present school practice, hence need no further consideration at this time except as a study of labor saving machinery. One of the largest mixing plants ever used is now building the locks, etc., of the Panama Canal.[2]

For school purposes much more simple methods will be employed.[3] The first essential is a mixing board which should be water tight. It may be a large platform (10′ x 10′), or a small board placed on a bench or table. The tools required vary according to how pretentious the problems are. A shovel, rake, and several buckets are ample for most work. Screens for sand and gravel as well as a wheelbarrow may be needed.

Any cement manufacturer's handbook has full directions for hand mixing which are well worth careful reading. Briefly, the method is as follows,—

[2] Popular Electricity, March, 1911.
[3] "Mixing and Placing Concrete by Hand." Bulletin No. 20.

A layer of sand is spread near one corner of the mixing platform. Over this the proper amount of cement is spread. Beginning at the edge of the pile, both sand and cement are turned towards the center of the platform. Each shovelful should be allowed to run off instead of

FIG. 4. GARDEN JAR AND COMPLETE APPARATUS FOR MAKING IT.

dumped to aid the mixing process. This *turning* is repeated twice by which time the mass should have an even color, showing no streaks. If a small board is used, a trowel may be used for mixing. Gravel or broken stone, which has been previously wetted, is now spread over the mixture, water is poured on slowly, the whole mass turned three times or until well mixed and of the right consistency for the problem in hand.

METHODS OF USING CONCRETE.

While concrete is used for an endless variety of things, the methods of use may be classified under four heads,—

1. *Mortar.* Where durable walls are required, a mortar made of cement, coarse sand and a small quantity of slaked lime putty is used.

2. *Forms or molds.*[4] The largest amount of concrete work is accomplished by means of forms, the insides of which are similar in their

[4] "Forms for Concrete Construction." Bulletin No. 13.

relation to the soft concrete as a sand mold to the molten metal poured into it. Various materials are employed in the construction of forms, and they will serve as a basis for study in detail.

a. Wood is most commonly used as it can be secured nearly everywhere. Any variety that does not greatly warp or change under the influence of water will do. Green lumber is preferable for certain classes of work if it can be secured. Wood forms are easily constructed and inexpensive.[5] In making them care must be taken to follow every principle of construction which minimizes expansion and contraction, and aids in keeping the form fit for repeated use. The life of a wooden form is, however, comparatively short, hence the use of wood for this purpose is limited to work where permanence and length of service are of less importance than first cost.

b. Metal forms are used where length of service is a prime factor. Iron and steel are the materials employed. The surfaces coming in contact with the concrete are usually protected against rust by galvanizing.

c. Plaster of Paris molds are easily constructed, and give quite satisfactory results.[6] [7]

d. Glue or gelatine molds are used for objects having more or less "undercutting," such as statuary, etc.[7] They are so pliable as to allow pulling and stretching sufficient to remove the concrete after it has set.

e. Sand molds may be used for certain kinds of ornamental work, pottery, etc.

The first step in the use of the mold after it has been completed is to prepare it for the concrete. The mold must be perfectly smooth and then oiled or greased to prevent the concrete from sticking. Soap, linseed oil, lard, or tallow candle cut in turpentine may be used for this purpose. Concrete is now mixed, the proper proportions and consistency having been determined for the problem in hand, and placed in the mold. If this be of such a nature as will permit tamping, i. e., wood, metal, plaster, the concrete will be "spaded." This consists of running a spade, trowel or thin piece of wood up and down along the inside of the mold where the finished surface of the concrete will be exposed. Spading forces the coarse aggregate away from the mold and

[5] "Garden Furniture," School Arts Book, April, 1910.

[6] "Garden Furniture," School Arts Book, April, 1910.

[7] "Concrete Pottery and Garden Furniture," Davison.

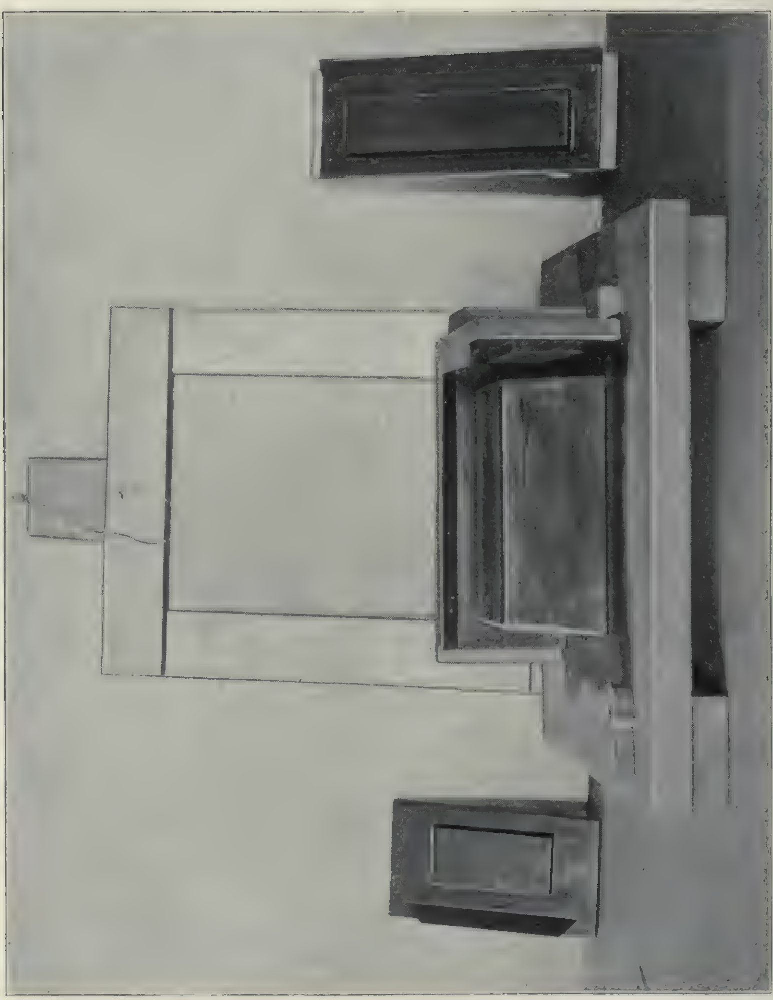


FIG. 5. FORM FOR FLOWER BOX WITH SIDE AND END REMOVED. THE SAME FRAME IS SHOWN ASSEMBLED IN FIG. 2.
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allows the finer material to flow into its place. The concrete is now tamped to insure the removal of all pockets and left for an hour to set. The cores and all parts of the molds likely to swell and stick are then removed. The entire mold is removed as soon as the concrete has hard set, i. e., at least to such a degree that the cast object will keep its shape. The mold is thoroly cleaned as soon as removed and may then be used again if not broken, warped or twisted out of shape. The surface of the cast piece is now finished by one of the methods described on a later page, then set aside and kept damp by occasional sprinkling for several days to prevent cracks due to uneven and too rapid drying, and incomplete crystallization due to lack of water.

3. *Stucco* is an increasingly more common method of finishing buildings of all kinds. Its popularity is due to its appearance, durability and low cost. Concrete block, brick, or natural stone walls may be covered by this method. Such walls must be thoroly cleaned and soaked with water to insure the bonding of the stucco with the wall. Smooth walls may require roughing to give satisfactory results. Frame buildings are covered with roofing proper, then furring strips are nailed on and to these strips wire lath is fastened. The wall is then ready for the stucco. Usually two coats are given for either class of building. The first coat, known as the "scratch coat" is a mixture of cement 5, sand 12, slaked lime putty 3, and a small amount of hair. It is applied in the same way that plaster is. The surface is roughened with the trowel point or a stick. The "finishing coat" is composed of a mixture of cement 1, sand 3, slaked lime paste 1. It is applied when the scratch coat has set well. It may be smoothed with a wooden float or thrown on with a brush or trowel. The "pebble dash" finish is thrown on in the same manner, the mixture in this case being cement 1 and screened sand and pebbles 3.

4. *Concrete pottery* and garden furniture has only recently begun to appear on the market. Some of it can be most easily made by using various kinds of molds. Certain problems, however, are best made by "sweeping" them up in the following manner,—The outline of the piece to be swept up is drawn on paper, then transferred to sheet metal (tin, brass, etc.), out of which a templet is cut. This templet is tacked to a board which has been cut to correspond roughly, to the design. A crosspiece is now nailed or screwed to the board to which the templet is fastened, then a one-half inch hole is bored thru the crosspiece at a

point which will be the center of the finished concrete object. A half-inch dowel-rod is now inserted in the center of a board somewhat larger than the diameter of the problem to be made. The templet is put in place by passing the dowel-rod thru the hole in the crosspiece.

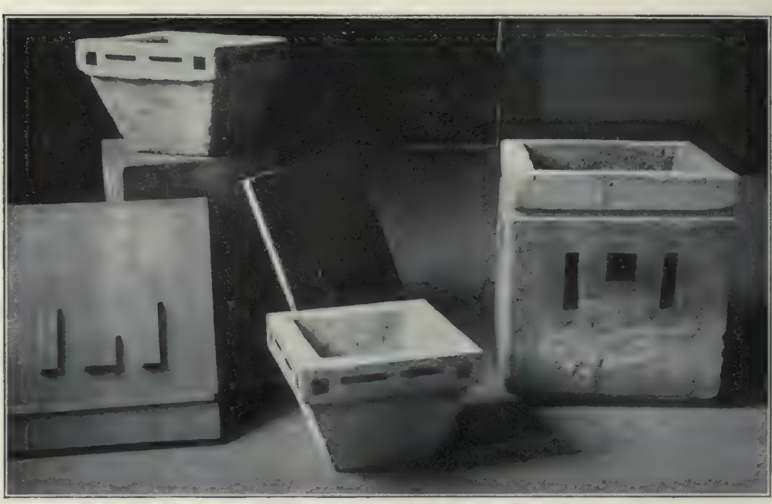


FIG. 6. GARDEN JAR AND FLOWER POTS DECORATED WITH INLAID TILES, AND MOLD. COURTESY OF EDWIN F. JUDD.

Concrete of medium consistency and small sized aggregate is now packed about the dowel-rod until it approximates the finished object in size and shape. By revolving the templet about the dowel-rod the superfluous material is cut away. The low places are filled as they appear until the templet touches all the way around and the job is complete. Points to remember are that the dry mixture sets up quickest, and that trouble is bound to occur when the mixture is too wet to retain its shape. Again, large pieces of aggregate are troublesome because as they are torn out by the revolving templet, some of the concrete comes along, leaving bad holes. If a brushed surface is desired, aggregates may be used by taking pains to keep them far enough from the surface to avoid being pulled out by the templet. Scrubbing will then readily expose them.

The above method applies to solid objects. When garden jars, etc., are to be made, a core is required. This core is placed on the board mentioned above, the dowel-rod passing thru a hole in the center of the

bottom of the core. For obvious reasons such problems are made upside down. A layer of concrete is packed all over the core and then turned down as thou it were a solid object. Care must be taken to have the walls thick enough to withstand the strains to which they are subject. Simple reinforcing may be used to good advantage. The dowel-rod hole in the bottom may be left for drainage, but if not wanted it can be filled with concrete as soon as the jar has set hard enough to be removed from the board on which it was turned.

FINISHING, COLORING, DECORATION.

When the first concrete object comes from the mold it is apt to be unattractive, as all concrete work made with ordinary Portland cement has the usual monotonous dull grey appearance, unless something is done to improve the surface and to make it more attractive. Here opens a field of considerable opportunity, texture, color, design—all may be had.[8] The various methods in use may be grouped into two classes for study.

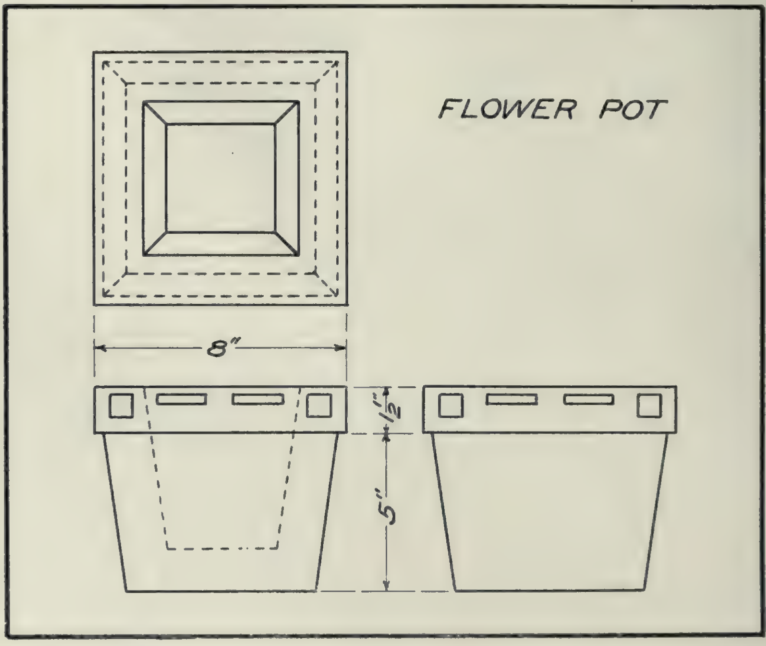
a. Removing the film of cement mortar to expose the aggregate. This process is the more permanent and pleasing. Various methods are employed to obtain the desired results. A special mixture of concrete is placed in the mold on the side nearest the surface to be exposed. The aggregate in this mixture consists of carefully graded gravel or broken stone of the size and color desired—limestone, granite, marble, natural gravel, etc., giving the most pleasing results. This special mixture is used merely as a facing for the backing of ordinary concrete. As soon as the forms are removed, the surfaces to be finished may be brushed with a stiff brush of wire or fiber bristles until the aggregates are exposed. Water will help the process materially. An acid wash is now applied to thoroly clean the exposed aggregates. This acid wash is a 30% solution of commercial muriatic acid for use on a concrete made of ordinary Portland cement. The same sulphuric acid solution is used to wash concrete made of white Portland cement and white aggregates. These washes are applied with a brush and immediately washed off with clear water.

Another method is to let the concrete become somewhat harder and then to rub the object with a brick, old concrete, a stone, or coarse sandpaper, until the whole surface is smooth and uniform. Surface

[8] "Concrete Surfaces," J. C. Chubb, Ass't. Inspecting Engineer, Universal Portland Cement Co.

imperfections may be filled with grout. Fine aggregate is desirable for use when this method of finishing is to be followed.

The two methods given above are to be used on green concrete surfaces. When a piece of work has thoroly hardened, the same ap-



pearance may be secured by the methods employed in finishing natural stone. A rough dressing may be given by means of a stone ax. A smooth uniform surface is secured thru the use of a bush hammer. Commercially, such work is done with pneumatic tools or sand blasted.

b. Coloring the body of the concrete is another method of improving its appearance.[9] Color materials are added in dry form to the cement and thoroly mixed before sand or water is added. Few colors are available upon which cement does not react, or which do not weaken the mixture if used in larger quantities than 10% by weight. In other words, intense or rich colors are not possible without danger of weakening the concrete. Lampblack, ultramarine and prussian blue, yellow ochre, burnt umber, venetian red, may be used to color with more or less success.

[9] "Cement and Concrete," L. C. Sabin.

Surface colors are made from the same materials and cement. This is applied as a wash after the forms are removed. It is likely to "craze" or crack in time. Various patent preparations are on the market which seem to be quite satisfactory.

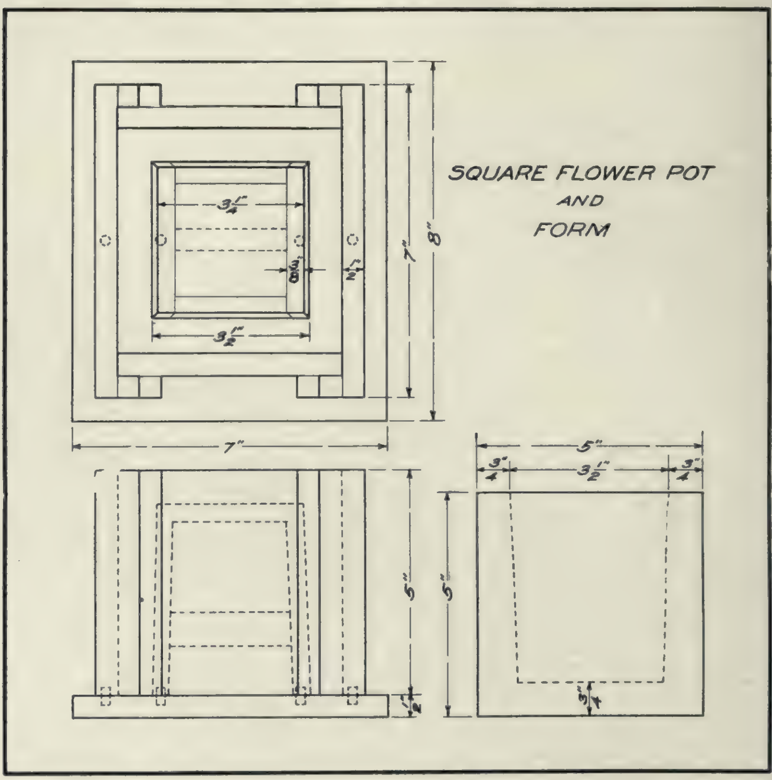
Another variety of surface is secured thru the use of a lean mixture used so dry that no grout flushes out against the forms when tamped into place. This leaves the aggregate exposed, but all of a uniform grey color.

Aside from coloring by means of dry color, or exposing of colored aggregates, considerable opportunity for decoration is found in the use of designs bringing out line, dark and light, etc. Depressed designs similar to the incised decoration of clay work, may be made by fastening pieces of wood, of a size and shape corresponding to the design, to the surface of the form. Care must be exercised to keep the design simple, each piece of wood must be smooth and have some draft to prevent the concrete from sticking, and the concrete must be sufficiently tamped to insure the filling of every corner of the design. A development of this idea is to fasten pieces of wood to the mold which leave depressions in the concrete of the exact size and shape of tiles. (These tiles may be made by the pottery class or secured from a manufacturer of fire place tiles.) As soon as the form is removed a small quantity of thin cement mortar is put in the depression and then the tiles are pressed into place. A second method of placing these tiles is to paste them face down on a piece of glass in the position desired to carry out the design. Place concrete over these tiles to form a slab, which, when set, is removed from the glass and placed in a depression made for it in the surface of the object to be decorated. A third method is to paste the tiles face down to a piece of paper and then to paste this to the form, after which the concrete is placed in the usual way.

REINFORCED CONCRETE.

Having thus covered in a brief way the various steps in making and finishing an article in concrete, three general topics still need to be considered before more elaborate work is undertaken. As concrete becomes somewhat familiar thru use, it is found to be very similar to stone. For instance, a column will support tremendous loads under direct pressure but it is so brittle that it will snap under pressure of a comparatively small load so placed as to cause it to bend or stretch. Modern engineers have found a way to counteract this defect by using

steel rods in concrete masses likely to be under stress or strain. Reinforcement is a rather new but a much used term. It applies to that type of construction which employs both concrete and steel. The present general use of concrete for building purposes would be impossible



were it not for the fact that the toughness, the elasticity, the great tensile strength of steel plus the rigidity and great compressive strength of concrete give us a combination far stronger and more serviceable than either material alone.

Reinforcement is of two kinds, broadly speaking, bars and wire. Bars are of several classes, smooth, corrugated, or twisted. The latter styles give slightly better results because of a closer bond or union with the concrete. Wire is used in the form of cables or woven. Expanded

metal, metal lath, etc., are entirely different in construction but come in the same general class as wire. Reinforcement comes either galvanized, painted, or plain. The latter is just as permanent as either of the first two, providing that it has been properly imbedded. The all important factor is correct placing of the reinforcement if it is to accomplish the purpose intended. It must always lie nearest the surface where the greatest strain comes, and in the direction best adapted to support the load. Rules for spacing of reinforcement are out of place in a study of this sort, but are readily available if required for special problems.[10]

WATER PROOFING.

Before many problems have been executed the question of making something watertight comes up, as an aquarium, or tank, for example. Waterproofing has come to be a necessity for many kinds of work. Subways, tunnels, basements, etc., are typical examples in the industrial world. Two groups may include the various ways of making concrete impervious to water. The first is within the concrete itself. Density, and consequent imperviousness is secured by the use of a rich mixture, by the addition of hydrate of lime, fine silt or clays, by patent preparations and by the use of a coarse aggregate. The second group includes various surface treatments. Troweling on both sides brings the cement grout to the surfaces making dense films impervious to water, or a second coat of cement mortar, patent waterproofing materials, tar, tar paper, etc., are used to secure the desired result.

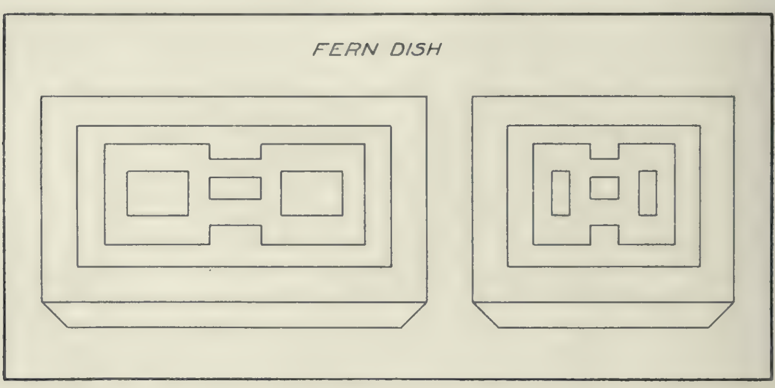
FAILURES.

Before finally leaving the topic some consideration should be given to failures. Concrete is one of our most durable building materials, as even the old Roman ruins built of inferior cement prove. As to fire resistance, reference need be made only to two recent great fires, Baltimore and San Francisco, where concrete proved superior to other materials. If so enduring, why then so much faulty work? The first reason lies in improper or careless methods of use. As has been stated, the characteristic property of cement is to set once soon after it gets wet and then no more. Hence, a larger amount of concrete than can be used very soon should not be mixed. Workmen sometimes retemper concrete, or delay a long time in placing the concrete, and the owner

[10] "Concrete Construction about the Home and on the Farm," Atlas Portland Cement Co.

"What Concrete Will Do," Lawrence Cement Co.

suffers the loss by faulty work. Again, water is essential to complete crystallization which takes a month or more. A sidewalk or wall exposed to direct sun and air as soon as placed, with no subsequent sprinkling, will harden imperfectly and soon show defects. Aside from these considerations concrete shrinks in drying, which fact must be



provided for in the construction of forms, or bad cracks may start. Concrete also expands or shrinks with changes in temperature, for which allowance should be made.

While most faults are due to bad manipulation, certain troubles lie in the materials themselves. Sand, gravel, etc., and water must all be clean. As to cement itself, rigid tests have been laid down by which a sample may be examined in the laboratory, while more simple tests can also be followed in the school work shop.[11] Space forbids more than a mere listing of these laboratory tests,—

a. Specific gravity
b. Fineness
c. Time of setting
d. Tensile strength
e. Constancy of volume
f. Sulphuric acid and magnesia.

The expense connected with a course in concrete is but slight. Illustrative material in the way of papers, books, pamphlets, advertising matter, can be had in quantities. Samples of cement in various stages of manufacture are obtainable. As to equipment, most of the forms will be constructed out of wood for which purpose the usual shop equipment is ample. Measuring boxes, frames for sand and gravel screens, tampers, wooden floats can all be made as part of the course. The only

[11] "Dragon Portland Cement," Lawrence Portland Cement Co.

extra tools needed then are a few trowels, a shovel, several buckets, and perhaps a rake. For sidewalk construction an edger and jointer will be needed which need not cost over $1.50 each. Ten dollars would seem ample for the extra equipment needed for a thoro course in concrete in the grammar school.

The cost of materials is likewise low. Cement costs about $2.00 per barrel; in bags, four to the barrel, the cost is a little higher. Sand and gravel vary in cost according to locality. Colors run from two cents per pound upward.

A great variety of problems are possible and well worth while in such a course. A mere list of things done or in process of construction by boys in the grammar grades must suffice,—

a. Square flower-pot, or model hollow concrete block.
b. Rectangular fern dish with incised or raised design.
c. Window boxes, garden jars, decorated with inlaid tiles.
d. Birdhouses, ranging from cast reinforced to stucco, illustrating as many as possible of the five types of concrete houses.
e. Sundials, garden jars, vases, made by sweeping up.
f. Lawn rollers.
g. Posts,—fence, gate, hitching, and tennis net.
h. Aquariums.
i. Hens' nests, poultry feed and watering troughs.
j. Carriage blocks, garden seats.
k. Brick and block machines.
l. Bridges and similar construction.
m. Sidewalk construction.

The field here outlined is such a broad one that details in many instances are necessarily lacking. It seems evident that concrete construction has possibilities within itself for use in a course of study. Just as accurate workmanship, just as thoro training for the hand, may be secured in working out the various forms as would come in the same grades from the usual woodwork. There would be this distinct gain, however, that a boy would, in addition, become familiar with some of the processes and uses of a material destined to play a growing part in the life of the future.

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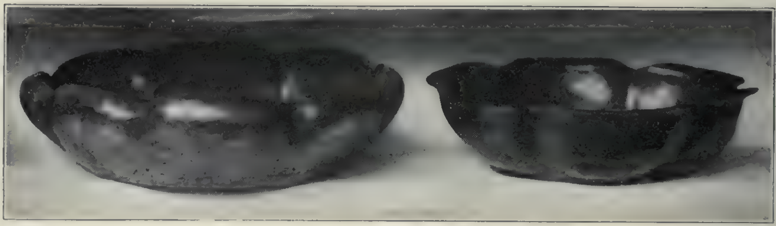


COPPER NUT-BOWLS, CONCAVE FLUTING.

METALWORK WITH INEXPENSIVE EQUIPMENT FOR THE GRAMMAR AND HIGH SCHOOLS, VIII.[1]

ARTHUR F. PAYNE.

THE problem of making the small bowl described in the last issue, leads naturally to the problem of the nut bowl, which is the same in principle, using the same tools and methods, but requires a larger disk of metal. It also opens up to us a splendid opportunity to illustrate and use a characteristic and typical method of decoration for sheet metal forms, namely, that of fluting, sometimes called shaping or modeling.[2]

The bowl marked No. 1 in the photograph shows the simplest and easiest form of fluting and will be used for the purpose of describing the process. For a nut bowl a circular piece of 18-guage flat copper or brass is cut out from 7″ to 10″ in diameter. It is then "raised" to shape by the method described for the small bowl. After the bowl has been raised to a form that is true and even, we are ready for the process of fluting, the first step of which is to divide the bowl into 5, 6, or 7 parts by drawing vertical pencil lines down the sides where the flutes are to come. The above number of divisions is suggested because it is one of the well-known rules of design that it is usually best to divide such forms into 5, 6, or 7 divisions.

[1]Copyright, 1911, by Arthur F. Payne.

[2] The method of fluting plates was described in the April, 1911, number.

The next step is to make a fluting block,—a piece of some hard wood, preferably maple, about 12″ long 2″ wide and 1½″ thick, with the end shaped into a flute like that which you wish to produce on the bowl as shown in the drawing. The shaping of the wood may be done with a wood rasp and coarse file. Do not try to make the end of the

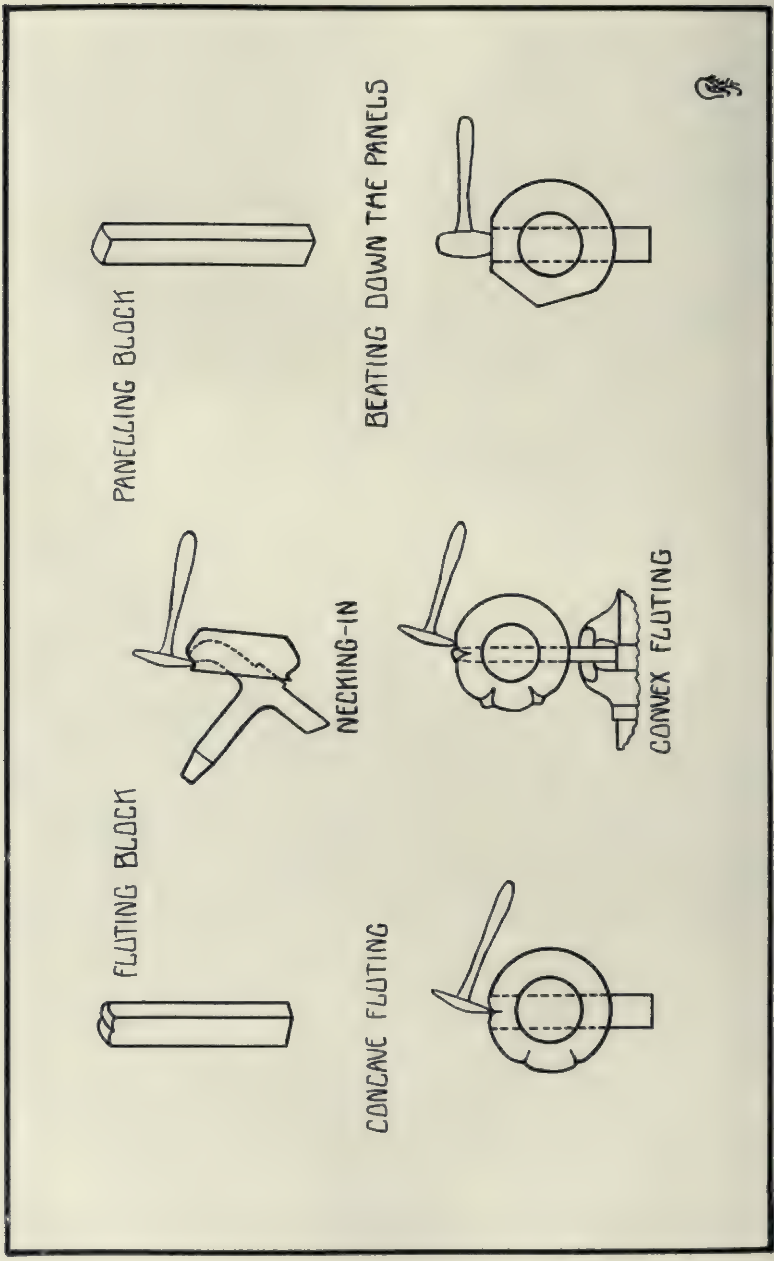
COPPER NUT-BOWLS, CONVEX FLUTING.

fluting block exactly the shape and size of the flute in the bowl, but make it a little smaller in size and curvature. This is so that you can move the bowl around more freely when you are doing the actual fluting. Fasten the fluting block upright in the vise with the modelled

COPPER NUT-BOWLS, "NECKED IN."

end up; place the bowl over the end of the fluting block with the vertical pencil line exactly over the flute in the block, and beat the metal down into the flute with the neck hammer, No. 7293,[3] as shown in the sketch. This will require considerable care and some practice to get a smooth uniform flute. If the metal gets very stiff and hard soften it by "annealing" as described before. When the bowl and the fluting is uniform and true it is ready for the cleaning and "planishing"

[3] See December, 1910, number, p. 169.


PANELLING BLOCK
BEATING DOWN THE PANELS
FLUTING BLOCK
NECKING-IN
CONVEX FLUTING
CONCAVE FLUTING

process described in previous issues. It will be found that the fluting process will have a tendency to draw the top of the bowl in and make it a little small in diameter. Advantage may be taken of this fact to vary the design and get a sharp curve at the edge of the bowl that makes it more interesting as shown in the No. 1 bowl in the photograph. This fact of the fluting process drawing in the edge is something to be taken advantage of to produce a better and more characteristic bowl and should not be taken as a restriction to hold us to a certain form, as sheet metal in the hands of a competent craftsman is manipulated with a freedom and ease which is astonishing in many respects. As an illustration of this, the bowl No. 2 was raised and fluted in the same way as No. 1 but the edge was hammered out, giving the section of the bowl a petal like shape.

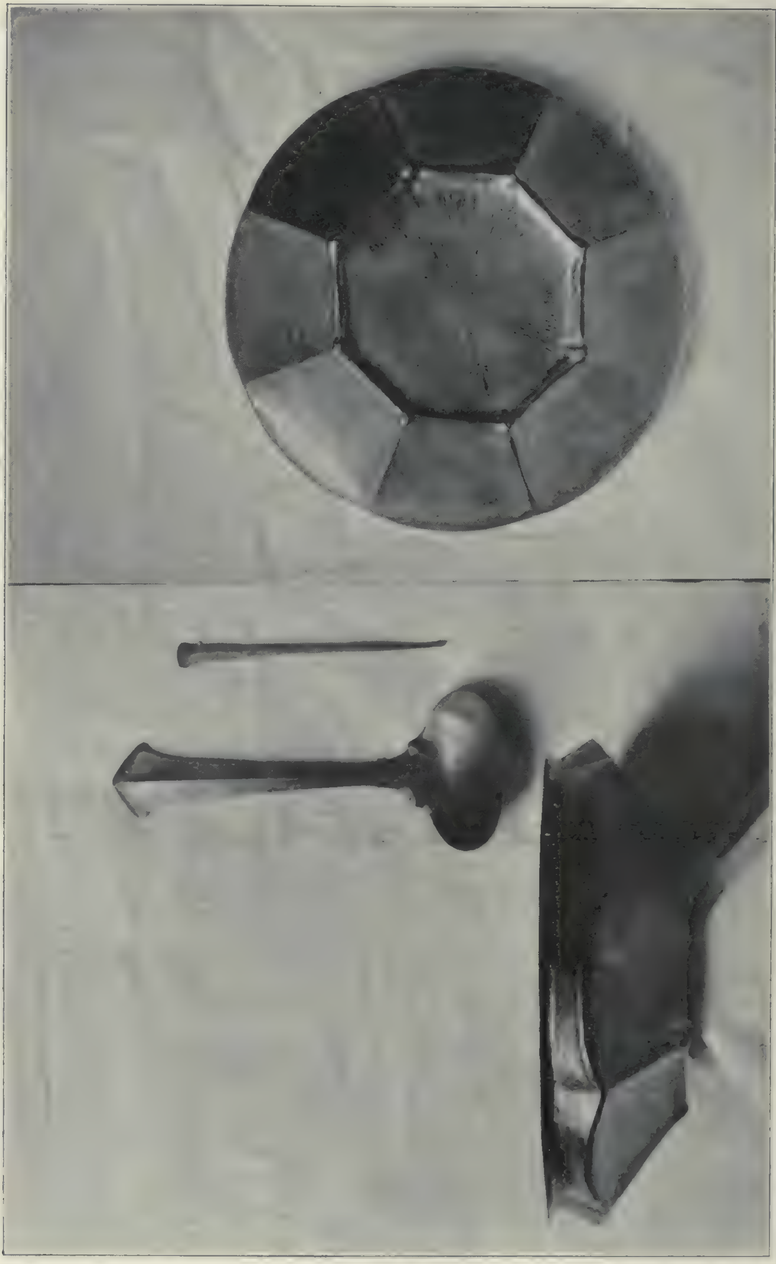
SILVER NUT-BOWL, PANELED.

The type of flutes described above are known as concave flutes. There is also the convex flute which is shown in the bowls No. 3 and No. 4. This type of flute is made by placing a piece of iron or hard wood filed to the approximate shape of the flute wanted in the vise and placing the vertical pencil line drawn on the side of the bowl exactly over the fluting block and then beating the metal down alternately on each side of the block with the neck hammer as shown in the sketch.

There is still another development of this characteristic means of modifying the shape of a bowl and that is by "paneling" the sides as shown in No. 4, a silver salad bowl. This is done by making a paneling block, a piece of hard wood about 12″ long, a little narrower in width than the width of the panel and about 1 inch thick and shaped with a slight curve in one direction on the end, as shown in the drawing. The bowl is placed on the paneling block so that the vertical pencil lines come to the edge of the block, then the metal is beaten down to the block with a smooth wooden or rawhide mallet as shown in the drawing.

It must be remembered, when using either the concave or convex flutes or the paneling, that the bowl must be raised to shape first, then the pencil lines are drawn down the sides, then it is paneled or fluted and afterward cleaned and planished all over.

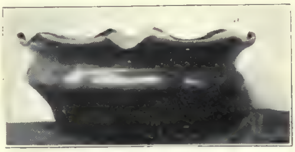
The logical progression in the series of problems that we are following brings us to the interesting process of "necking in"; that is, drawing



NUT-BOWL, SPOON, AND NUT-PICK.

a nut bowl, vase, jardinere or pitcher, in sharply near the edge making a neck. This process is best illustrated by "necking in" a nut bowl similar to those illustrated in the photograph which are all "necked in." No. 1 is a plain bowl, No. 2 is fluted with the convex flutes, No. 3 is fluted with the concave flutes.

The process of necking in is similar to that of the fluting, the main difference being that the neck, which is simply a continuous flute running round the bowl, is horizontal instead of vertical. To "neck in" a nut bowl, first draw a pencil line around the bowl near the edge just where the bowl begins to change its shape into the neck. Then place the tee-stake, No. 146-A,[4] in the vise in the position shown in the drawing and beat down the metal just above the pencil line. Care must be taken to strike the metal so that the neck hammer drives the metal down the side of the tool as shown in the drawing. It will be found necessary to anneal the bowl two or three times during this process.



JARDINIERE "NECKED IN" EDGE AND FLUTED SIDES.

The edge of the bowl may be left flat as in No. 1 and No. 3, or it may be fluted and shaped as in No. 2 or like the photograph of the jardinere. The order of the steps taken in making the No. 2 bowl or the jardinere are, (1) raise the bowl, (2) beat in the neck, (3) flute, (4) clean and planish, (5) color and finish.

The double photograph which shows the two views of the same bowl shows the extent to which these problems may be carried. It also shows two simple problems that go naturally with a nut bowl, namely, the nut spoon and nut pick.

There are three distinct methods of making a spoon by hand, and the spoon illustrated is made by the simplest process, which is to transfer the outline of the spoon to the flat piece of 18-gage metal, saw it out with the jewelers' saw-frame, and beat the bowl of the spoon into shape in the hollow wooden block described before. It will be necessary to raise a flute down the handle to stiffen it as the 18-gage metal is not strong enough if left flat but it is plenty strong enough if it is fluted and shaped and well planished afterwards.

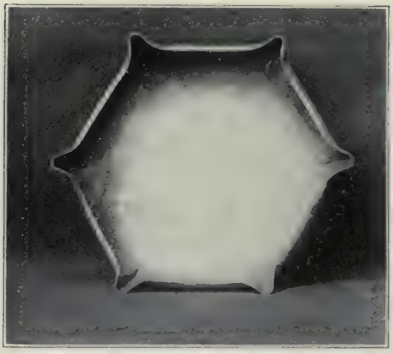
The nut pick is made from a piece of round soft copper wire $\frac{3}{8}''$ in diameter and as long as needed. The process is: heat the wire red

[4] See April, 1911, number, p. 374.

hot, hold it by a pair of pliers on the tee-stake and forge it into shape with hammers, then trim off the rough edges with a file.

The photograph of the jardinere shows the extent to which this elementary raising and fluting can be carried with only a few inexpensive tools. The best way to approach these problems is to analyze the various processes and place them in order and the problem simplifies itself. The finished problem is valued for itself, but it cannot be compared to the benefit received by the maker in the acquired knowledge of tools and processes used in modifying a common material, the exercise of forethought and patience, the esthetic responses awakened, the necessary exercise of his imagination, the training in accurate observation, and, greatest of all, the joy of creating an object of utility and beauty.

(*To be continued.*)



BRASS NUT-BOWL, CONVEX FLUTING.

INEXPENSIVE BASKETRY.

William S. Marten.

THE basketry herein described is a result of several years experience with such work in the South—in the third to the sixth years of the Durham, North Carolina, city schools. It has been successfully carried on at slight expense, and has proved itself to be constructive work of real usefulness. In the illustrations will be seen a number of different kinds of baskets, all of which have been found entirely feasible for elementary school work. Others have become interested in the results of this work, so that teachers from other schools have come to learn the processes in order that they might introduce it in their own communities. In this way the work has lately been extended to a number of school systems thruout the state. It is earnestly hoped that this article with the aid of the illustrations will enable teachers to get this work successfully started in schools where such work is especially adaptable. The appended outline gives some idea of the working plan for the several grades.

ESSENTIAL VALUES THE MAIN CONSIDERATION.

It is a decided advantage for any form of handwork to be inexpensive, but to have a place in the school curriculum it must be handwork with values that are essential to both the individual and the community. All school handwork must be that in which children can be interested, and it must be closely related to life outside the school. The special form of constructive work herein described has been tested in the schools. The result shows that children become intensely interested in it, and that it can be vitally connected with their home and community life. From an educational standpoint, any form of handwork besides being easily adaptable to school use, should have values that involve a consideration of three factors: first, the correlative value of the materials used; second, the development value of the motor training involved; and third, the economic value of the articles made.

EDUCATIONAL VALUES.

The use of local materials provides for a definite correlation with the other school subjects. A study of the courses of basketry in the schools thruout the country, when considered with the surroundings of

these schools, will reveal that one particular advantage of this constructive work is almost entirely lost sight of. In most cases the materials are obtained from New York or elsewhere, while the valuable materials growing in the immediate vicinity of the school are neglected. In almost every locality, materials for basketry can be obtained near the school. In the Southland, especially in the localities of rich vegetable growth, the many tough grasses, pine needles, and like materials from marsh, field, and wood around the school house and the children's homes, can readily be gathered by the pupils themselves. If the materials in this way are obtained at first hand, rather than gotten from afar, a permanent association of interest is established. The child is easily given a broad knowledge concerning such materials. Their use as a primitive necessity, the nature of the materials relative to their use, the growth of the plant life—a study of all such factors give natural correlations with other school subjects and begin with things about which the children have some knowledge. When these relations are made the children understand more clearly the means necessary to secure the desired results. This will help the elementary school teacher to vitalize her work.

Second: the values in and consequent need of motor training especially in the elementary school are now fully established. Basketry as a form of motor training in the elementary school is valuable not only because the essential processes are simple, but because they require a very definite training of the judgment in the use of the eye and the hand. From the simple basic processes, they can be made more complex as desired. The development obtained involves the following factors: (1), the deciding upon suitable materials for the work in hand; (2), the getting of even spaces; (3), the sensing of a strong outline; (4), the judging of fine proportions; (5), the obtaining of beautiful color harmonies, such as those formed by the combination of the soft greens of the rush, or the rich grays and brown of the pine needles, with the subdued yellow of the palmetto or cane, and (6), the splendid examples of line rhythm as the stitches move around and outward from the center, and mount around and upward to the top. These are art principles in applied design of a very practical type. A well made basket, evenly stitched, of good proportion and outline is evidence of the artistic merit of this work. In the classroom a few poorly made baskets and a number of well built baskets of good outline and proportion as examples of what to avoid and what to strive for, with suggestions of caution against the one, and encouragement to strive for the beautiful in the other, will

furnish an incentive for the pupils to strive for the highest type of workmanship.

Third: The economic value is in the varied and practical uses for which the baskets are made. If the basket made has a definite use in which the children are interested they can be made to feel that they are putting their own selves into the work. Basketry of this kind includes the making of table mats, serving trays, laundry hampers, door mats, fruit trays, baskets for fruit, for church collections, for waste paper and trash, for carrying lunch, for trinkets and jewelry and almost any receptacle for holding or carrying purposes. Such baskets when thoughtfully chosen serve a very practical use in the community or in the homes of the children. When the children are taught to make profitable use of the raw materials that lie immediately at hand, they are realizing how to master their own environment. And when this is the making of a commercially valuable article with material that is previously considered of no value, there is involved an important economic aspect. If the school is to prepare the children for doing their share in meeting the social needs of the community, it is of importance that the children be made to realize this economic aspect. Work, chosen with such an aim, provides a definite purpose in the minds of the children toward which their activities are directed. Therefore such activities cannot be aimless.

PRACTICAL ADVANTAGES.

The interest of all, the ease and convenience of handling, the variety of materials easily procured and adaptable to many grades, make basketry an especially desirable form of work. From experience with this work in the school room: (1), it has been found to afford equal interest for boys and girls; (2), it is clean, and practically dry, (water being needed only when starting the baskets); (3), it is light and easily handled by the younger children; (4), when carefully constructed the baskets are very durable; (5), the native materials furnish a very prolific source of supply so that to the average community the economic advantage of this work is a strongly appealing factor. In some communities, especially the rural ones, this work can be carried on with no expense whatever. In other communities the expense for equipment and maintenance is very slight. Even in many of the larger cities materials can be obtained very reasonably. After the material is located in the outskirts of the city the only cost should be that of transportation; (6), since the cured raw material can be piled up and the baskets in the

process of construction can be telescoped, but little space is required for storage purposes; (7), the variety of materials obtainable and the various uses to which the baskets may be put, afford a great variety of processes adaptable for the different grades; (8), the teacher with a minimum of experience in such work can carry it on with satisfactory results.

Various materials and types of baskets afford a variety of processes. Numerous processes, more or less explicit, are described in the various books on basketry, many of which contain excellent suggestions for various types of baskets.[1] The discussion that follows will have in mind the various types of baskets, but in order to be definitely clear, the present discussion on processes will deal only with the type of the continuous coiled basket.

EQUIPMENT.

The tools needed are few and very inexpensive. The only tools that are absolutely necessary are scissors or knife, and the needle, for large coiled work. The needle can be any sharp pointed instrument suitable for making an opening in the coil. They can easily be made by the pupils themselves, or enough for the whole class can be made by a few of the boys. A small piece of bone (horse bone is beautiful and of a fine texture), about four inches long, or the handle of a tooth brush, with one end filed to a point, is most satisfactory and lasting. A piece of wood (hard wood is preferable), does the work very well. The point must not be sharp enough to cut. This sharpened point pushed into the coil where the stitch is to be, makes an opening thru which the material used for the thread is drawn. For the small coiled work, where the material used for the thread is pliable, such as raffia, silkatine, or a fine tough grass, a needle with an eye is required. These needles should be fairly large so as not to be easily lost. Those ordinarily used for darning, or "No. 19 Tapestry" needles as used for raffia work, are very desirable.

MATERIALS.

The great variety of adaptable vegetable fibers allows for a wide range in the choice of materials. The supplies used are mainly determined by the available vegetation. A little experimenting with the

[1] Mary Rollins Tinsley: "Practical and Artistic Basketry."
Mary White: "Baskets and How To Make Them."
George Wharton James: "Indian Basketry."
Luther W. Turner: The Basket Maker.

necessary processes in handling these available materials will be productive of excellent results. The great bulk of the continuous coiled basket is made up almost entirely of the coil itself. This can be made up of a great variety of materials, such as the tough rushes and grasses from the marshes and meadows, the long and short needles from the pine trees, the stalks of the oats, rye, and wheat, and even the husk and leaves of the corn, the leaves of the cat-tail, the flags, and the palmetto when split up into fine strips. There are very many materials that can be satisfactorily used. Toughness and length are the most desirable qualities. Select the toughest and longest vegetable fibers that can readily be obtained in large quantities. Avoid, however, the rough edge grasses as they cut the hands. If rushes and grasses are not available, the stalk of the grains—such as the wheat, oats, rye or the hay, can be satisfactorily used. Some one of these, or the parts of the corn, the cat-tails, and the flags, are available in almost any locality.

The material for the thread must be especially adaptable to the basket. For sewing up the coils, a long, narrow, strong, and pliable substance is necessary. This we will call the thread. For this purpose the tough flat grasses are most desirable, and often the skin bark stripped from the palmetto, or the long leaves of the cat-tail are suitable. When a suitable material for the thread cannot be obtained from the neighborhood, the commercial cane is best used. For the various kinds of baskets many other kinds of vegetable growth can be used; the stems of the maiden hair fern for a rich dark brown thread, the bark and the slender branches of trees such as the cedar, and the red and yellow willow, the splints made from the oak and the ash, and the bark and stems of many vines such as the honey suckle.

The native materials gathered at any time during the year can be used very satisfactorily. However, they are at their best about the time they reach full maturity in the summer. Some are best before maturity and others when the seed is ripe. Study and experience with the available materials are helpful in obtaining the best results. When gathered at maturity the most of these materials are tough and do not become brittle even when thoroly dried out. On account of this pliability it is hardly necessary to dampen when starting a basket, as is necessary with that gathered at other times. The rush gathered at other seasons, as in the springtime, can be used satisfactorily; but it has not the length or toughness of the more mature growth. The children can readily bring in the materials used in their own baskets, or occasional

parties can be made up to go out after school hours or on Saturdays. Where it is not feasible to gather the year's supply when the growth is mature, and where there is freezing weather or continued wet spells, enough material should be gathered to last over these seasons. The use of wagons for hauling the material, after it is cut will greatly facilitate this work. Where large baskets are made in any numbers, a great quantity of the material will be required. A class will often use several two-horse wagon loads during the winter and early spring.

It is necessary that the green material be cured, that is dried out, soon after being gathered, else its color will become dark and lifeless, and it will be liable to mold. If made into a basket when green, besides being apt to mold, the necessary shrinking will result in a very loosely built basket when it does dry out. The material can be quickly cured in a few hours if put over warm radiators or in ovens, but after such treatment, altho suitable for building up the sides of a basket, it is rather brittle for starting one. The drying out should be slow. If the storage space will permit, the best plan is to spread the freshly gathered materials on the floor or on racks in a fairly warm room; or if convenient set it out in the sun for a few days. If light is kept from the green materials while being cured a grayish color will result. If the pine needles are put in strong sunlight they will become a rich brown color, but if all light is excluded an ashen gray will be the result. The leaves of the palmetto and cat-tail should be gathered before maturity, and split into the required widths before being allowed to dry. The skin bark from the stems of the palmetto should likewise be peeled off before the stem becomes dry. If the buds of the palmetto are separated and allowed to dry and bleach in the sun, they can be split with a pin into any desired width.[2]

If no native material for the thread is available it will be necessary to resort to the use of raffia or cane. The cane is imported in bale lots of 100 bundles, each bundle containing 1,000 feet. In the quality of the cane, there are four grades, from the best down as follows: All Long Selected, Extra No. 1, No. 1, and No. 2. For ordinary purposes the No. 1 is very satisfactory. The size or width runs as follows: carriage, superfine, fine fine, fine, narrow medium, medium, common, and binding. For the small baskets the "superfine" is desirable, while for the very large work such as the clothes hamper, or laundry basket, the "common" or "binding" is required. If the cane can be bought in bale lots from the importers in New York City, San Francisco, or other

[2] Tinsley's "Practical and Artistic Basketry."

large cities, a great saving can be effected over the retail prices. For instance the "medium narrow," as used in the waste baskets and work baskets, from the importers costs about $40.00 per bale or at the rate of 40 cents per bundle. This from the retailers costs from 60 to 80 cents per bundle. The prices for the same quality of cane from the various retail houses vary greatly. Some importers will furnish a bale made up of assorted sizes as desired at their regular bale prices. The prices at wholesale range from about $25.00 for the narrowest to about $50.00 for the widest size.

Varnish, the last item of maintenance, altho not a positive necessity adds greatly to the appearance and wearing qualities of the basket. It protects it from being soiled, keeps it from molding and preserves and enriches the natural color of the materials.

When raffia, instead of native grasses, is used for the sewing material, the coil, then called the foundation material, is usually completely covered by the raffia. This form is very common in school work when round reed or a heavy cord is used for the coil. For this work there are a variety of stitches in common use such as "Navajo," "Mariposa," "Lazy Squaw," etc. Since these are described in a number of books on basketry, a description of the processes need not be repeated here.[3] The opportunity for design with the use of colored raffia is one of the advantages of this work. The vegetable dyes made from berries, barks, leaves, roots, etc., produce most beautiful and harmonious colors. The aniline dyes, such as the "Diamond" dye, are obtained with less trouble, but great care must be taken to secure pleasing harmonies of colors. Excellent suggestions for dyeing with vegetable dyes can be obtained in some of the books on basketry.[4] Raffia comes in several qualities, the price of which varies but little. It is imported in bales of about 220 lbs. made up of hanks from two to five pounds each. The natural color raffia if obtained from the importers costs about 8 cents per pound, but is 15 or 25 cents when purchased at retail. The cost of the colored raffia is much greater than the natural raffia. From the importers in lots of 100 pounds, 10 pounds to a color, it can be obtained at about 25 cents per pound, at retail this will cost about 40 or 100 cents per pound.

[3] Worst's "Constructive Work." Tinsley's "Practical and Artistic Basketry." Knapp's "Raffia and Reed Weaving." James' "Indian Basket Making." White's "How to Make Baskets."

[4] Worst's "Constructive Work." White's "How to Make Baskets." James' "Indian Basket Making."

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(*To be continued.*)

ORIGINAL GARDEN VASE IN CEMENT DESIGNED AND CONSTRUCTED BY STUDENT. PENNSYLVANIA MUSEUM AND SCHOOL OF INDUSTRIAI. ART.

POULTRY HOUSE.

A GROUP PROBLEM—THE POULTRY HOUSE.

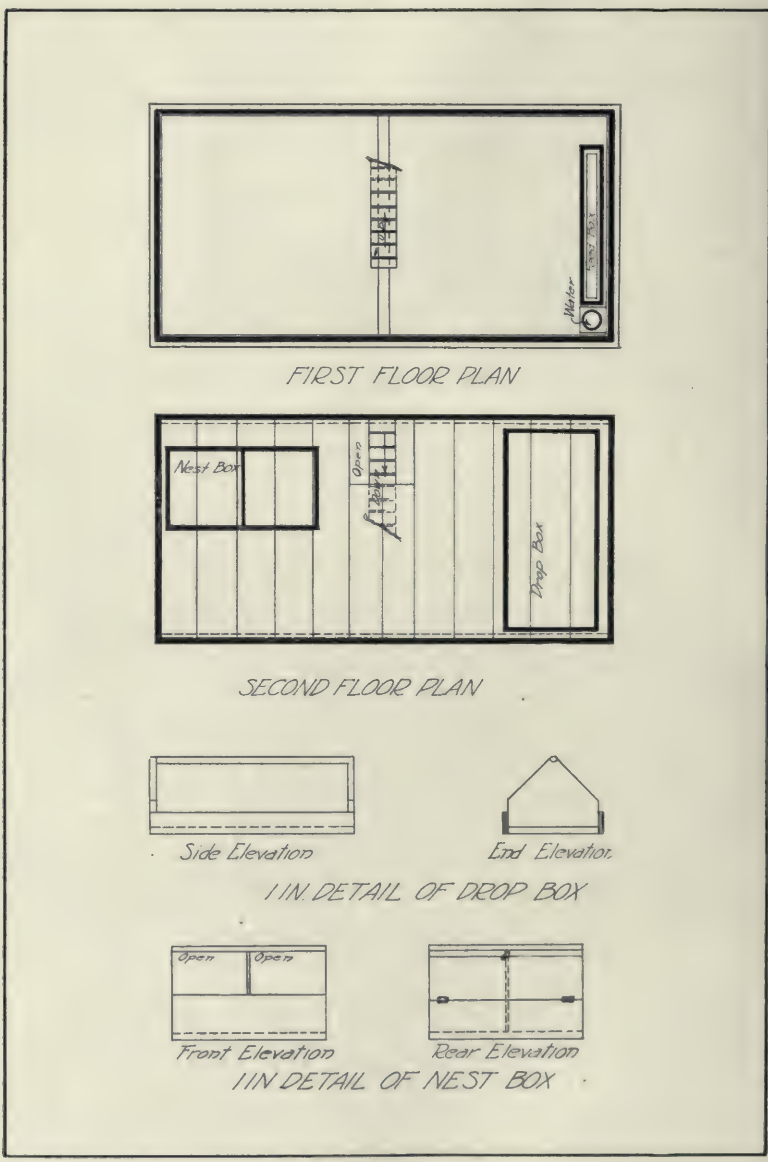
C. E. Westgate.

THE group problem can be introduced in any grade taking shop-work, beginning, perhaps, with the simple construction of the circus wagons and modeling of animals in clay, in the fourth grade, and continuing with more elaborate projects in the grammar grades; working out problems that are suitable at certain seasons of the year.

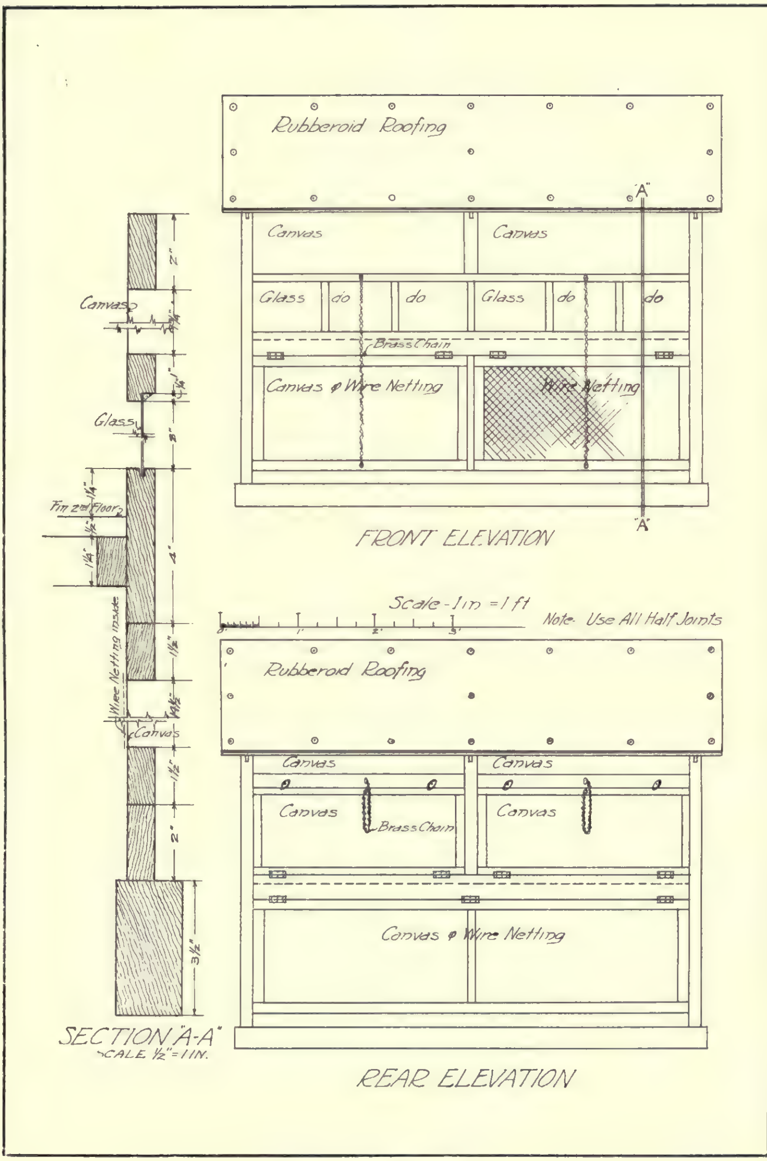
The rabbit, pigeon, or chicken industry, the wireless telegraph, the fireless cooker, aeroplane, or modes of transportation, offer excellent material for careful study and planning on the part of the pupils.

Of the problems mentioned the chicken industry will interest a class of boys whether in the city or country. This offers three problems—the poultry house, the incubator, and the brooder. The accompanying pictures and sketches cover the first problem. This poultry house was built by a class of twelve boys in the seventh grade.

The materials used, except the wood, nails, and stain, were purchased by the principal, the amount being deducted from the receipts when the house was sold. The remainder of the money was spent for athletic



POULTRY HOUSE.



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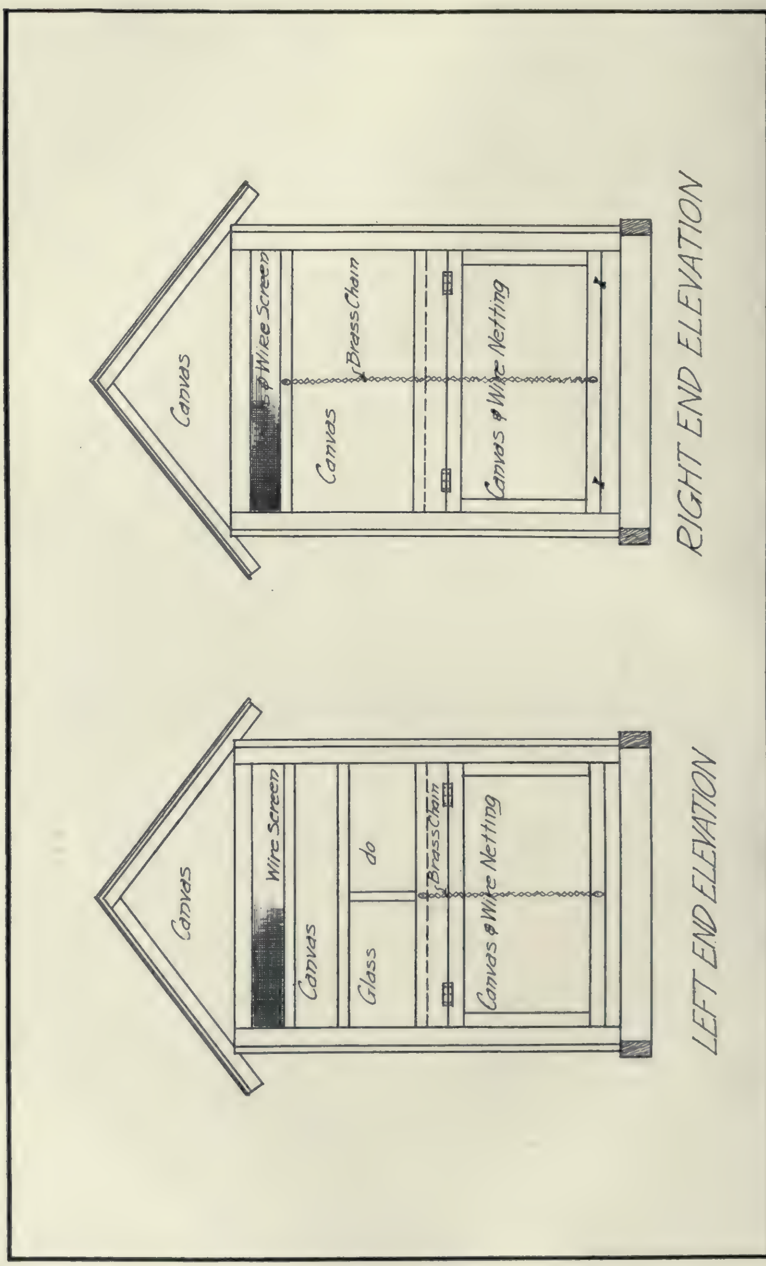


POULTRY HOUSE.

goods for the boys. The wood used was chiefly scrap lumber, such as can be found in any manual training room. It was dressed up, stained, and finished with a coat of shellac.

About eight yards of canvas, at 12½ cents, was used.

The rubber roofing, screen, and wire netting cost less than two dollars. The poultry house could be shingled at a small expense instead of using the rubberoid.

This poultry house will accommodate about eight grown chickens, a sufficient number for the resident of a city. It is not an uncommon thing to see a poultry house of this character in the yard of many residences of a western city.

The fact that many offers were received on the poultry house when it was offered for sale showed the boys that people outside were interested in their work. Work of this character which can be sold readily and put into actual use offers a greater incentive to the pupils to do more and better work than do the small useful household articles and plain exercise pieces, that so often constitute the whole course in our grade manual training work.

POULTRY HOUSE.

EDITORIAL

THE high school has been enriching its curriculum by the addition of new subjects and so-called courses. Students taking the newer subjects have been expected to carry the older ones as well, with the result, as claimed, that the school is teaching too many subjects to too many students at the same time. It has been thought that the high school period was the time for testing and trying out different powers and the time for forming life purposes. A feeling has been growing, however, that this period may very properly make a start along the line of a life purpose when once formed, bearing in mind that a final choice of purpose need not necessarily be forced upon the pupil at the beginning of his high school career, and if he does make a choice there should be opportunity for readjustment later in the course.

Vocational Courses in the High School

The spirit which prompts these claims is most commendable. The only difficulty in carrying them out may be that inherited notions of educational values, the background of teachers coming fresh from the college, and the subject matter in text-books, are not in the position to make the high school really democratic. Every orthodox high school man believes, for example, that the scheme of vocational studies should be so developed that a boy can change his mind and prepare for college. This he considers a democratic proposition and will pat on the back any vocational man that speaks such words of wisdom. But unfortunately, the same man would not recognize as equally democratic the converse of the proposition that traditional courses be so modified that a pupil can change his mind from an attendance at a high school and prepare for a definite vocation. To be sure everyone believes in testing and trying out pupils, but the testing and trying out consists largely in seeing whether the pupil has the right dimensions to enter the college door. To test and try out for trade and industry and to fit students for these things is a bit beyond the imagination of some. Let us practice democracy as well as preach it.

It is maintained by some good people that the high school period is one of liberal training and that this training should precede the voca-

tional. Some are beginning to see that there is a direct relationship between these two phases of educative processes, and that they should go together. Education is intended for service. All education is to prepare one for the vocation of living and living well. This means training for individual usefulness. The so-called liberal studies have social significance, and the student who pursues both the liberal and the vocational sees the relation of his own work to the work of others and to the welfare of society. To give liberal training without its vocational direction is to make word parrots. To give vocational training without its accompaniment of liberal studies is to train people to use their hands without their heads. The business of vocational training is not only to help the individual in his struggle for life but also the world in its effort to rise above the struggle for life.

The High School Curriculum It may generally be said that any high school curriculum should be considered from three points of view: (1) its socializing influence on its members. It will include those subjects which directly assist one people speaking one language, to work effectively and understandingly with common motives toward a united public opinion for improving the conditions of a unified society. (2) The introduction of those disciplinary studies which develop reasoning ability. Such studies oftentimes may be more valuable even educationally in developing the reasoning faculty if they have a direct bearing upon some definite activities within the school or within the experience of the student. (3) A group of electives which try out the different powers and test the capacities of individuals. After the test has been made and a decision reached this group presumes that a student will elect some one which leads to a distinct destination. To consider these three points of view more in detail:

1. The subjects of music and physical training, the social activities of school plays and athletics should be open to all pupils irrespective of course elected or probable destination. The subjects of English and history should also be taken by all students from practically the same viewpoint. The English should have as its entire aim the development of the power to write, read and speak intelligently the native tongue and to be able and willing to read understandingly good books in the days when the formal education is finished. The history should contribute toward making a thoughtful and efficient citizen in the democracy which we so earnestly seek. Unfortunately, at present

too much emphasis is placed upon the political side of history and not enough on its social and industrial phases.

2. The disciplinary subjects of mathematics and science have been given in their traditional order for years. It is somewhat unfortunate that they have relied almost entirely upon their disciplinary value. They have many practical applications to industrial activities; but it has been useless to attempt to make these applications when students had no knowledge of the industrial arts to which they might be applied. To attempt to solve problems of cutting speeds of a milling machine or the breaking strength of iron beams when the class was made up of both boys and girls to whom such terms were absolutely outside of their experience would be, indeed, futile. Some commendable correlation has been made between mathematics and physics, and this is good pedagogy. But to fill up a course of mathematics with so-called practical problems relating to machines, beams, castings, speeds of machines, etc., when these subjects are foreign to the student, is absurd. The same point may well be emphasized with reference to science. So long as the school has no activities to which the science work might relate itself, just so long it must be, and had better be, abstract, or, at least, only attempt to touch those activities common to the out-of-school experience of both boys and girls. However, the moment that vocational activities are introduced in the school the subjects of mathematics and science offer genuine and effective means of application to the requirements of trade and industry.

3. A group of electives should be offered in accordance with the probable destination of the student. To the liberalizing and disciplinary group of studies of English, mathematics, history and science will be added a foreign language for students seeking admission to colleges. To the socializing studies, the disciplinary and vocationally directed subjects of mathematics and science for those completing their schooling with the high school, will be added subjects directly vocational. The "commercial purpose" course will naturally have strong courses in the subjects of bookkeeping, typewriting, business writing, commercial geography, and shorthand. The "industrial and agricultural purpose" course will have intensive courses in the agricultural and manual arts and drawing. The "homemaking purpose" course must be rounded out with strong courses in domestic science and art, household decoration, sanitation, and personal hygiene. It cannot be emphasized too often that a vocational course does not consist merely of vocational subjects

thrown at random into a high school system. The vocational purpose must be satisfied by a definite course.

Cooking, sewing, manual training, agriculture, and shopwork are worthy of a more important place in the scheme of secondary education. To introduce these subjects not only in a corner of the school building, but what is worse, in a corner of the secondary school program, is to give them a position unworthy of their possibilities. We need a commercial purpose course, an industrial purpose course, a homemaking purpose course in our high schools—courses which have science work arranged according to possibilities of its correlation with vocational activities, with special mathematics arranged according to vocational interests, in addition to vocational subjects differentiated according to sex and destination. No one is willing to say that it is a waste of time for a boy in the college preparatory group to elect some handwork, or for a girl to take a little cooking and sewing, but the time to gain the most effective educational value from these subjects if they are to be taught apart from the rest of the high school studies, is when the boy or girl is in the elementary school. To elect shopwork without accompanying it with strong courses in mechanical drawing, related science and mathematics is to overlook the educational importance of true educational handwork in the secondary school. A line of shopwork which merely consists of making a few articles of furniture, which simply trains skill of hand, and which has nothing to do with vocational direction or with other school studies, has not the educational value to which the high school boy is entitled. Of course we are considering that handwork in secondary schools is to have educational value. If it is given merely to gain credits or to keep the boy busy or happy or out of mischief, then of course serious educational questions of how to make the manual arts really effective have no place in this discussion. —Arthur D. Dean.

More Time for Hand Work

The ideals of our educational system were fixed during the period of the Renaissance, at a time when the child was of interest to the educator only as material for the future classical student. These ideals have changed very little, for in effect we still have from the very beginning the same end in view, the preparation of the pupil for so-called higher education. The efforts of educators have been to adjust this system of education to changed social

conditions, or perhaps more truthfully to adjust changed conditions to our system of education, for it can hardly be said that there has been any serious departure from the one definite aim. We have talked of our liberal education for the masses but we have really bent our efforts in the direction of special education for the few.

But certain changes are taking place in our attitude toward the problem of elementary education. For the first time there is an inclination to fairly face the problem and to raise the question of whether there are not other means of development and culture than those handed down to us by tradition, whether there may not be means of education that will meet the life aims and needs of a larger number of children and open to them the doors of opportunity. Social conditions are demanding that the work of the public schools have a wider application, and the relative educational values of subjects in the curriculum are being more seriously questioned than ever before. For example, arithmetic and grammar have been the fetish of the grammar grade teacher. They are the subjects upon which hang all that is vital, the standards by which all values are fixed and all attainment measured. Failure in one or both means retarded progress or educational oblivion, and yet at least one-half of the arithmetic taught in the elementary schools can make no valid claim to the prominence given it on any ground—not because of its practical value, for it has no place in the experience of the child, immediate or remote. It is not even essential to the study of higher mathematics. As discipline it is of doubtful value if modern psychology be true, for similar relations rarely occur in later experience, and ability to solve useless and intricate problems is not necessarily coincident with accuracy, which is a vital element in disciplinary work. For cultural value it makes practically no claim. And the same is true of technical grammar in an even larger degree. Its essential elements are few and simple and are best acquired in use. As a subject, it is almost wholly unrelated to experience. What is said of arithmetic and grammar can be said in a greater or less degree of other elementary school subjects.

The essential element in school subjects is that which relates them to the experience of the pupil, and in the readjustment that must come, handwork can justly claim an important place in elementary school work. Pedagogically planned and presented, it can make large claims for content and subject matter, with the added value of opportunity for concrete expression in actual life experiences, which is so pre-

dominantly the natural means of expression of childhood and youth and which is so manifestly lacking in traditional school methods and subjects.

This has always been the futile claim of the manual training, met always by the counter claim of the over-crowded curriculum. Actual experience has demonstrated that two-fifths of the school day can be given to handwork, related to other schools subjects, without the loss of any essential of academic work and with greatly added power and efficiency in the pupil, and with it comes the culturizing effect of first-hand experiences with human interests and activities.

The claim for more time for handwork or hand expression can be justly made on educational grounds alone. The question of industrial education may be considered by itself as an added reason for emphasis upon handwork. —W. E. ROBERTS.

FROM OUR ENGLISH CORRESPONDENT.

Scholars as Workers

One of the most vexed questions that manual training men have to deal with in a rather vexed existence is the employment of scholars on remunerative work—that is, the production of articles or the doing of work which is of direct commercial value. This question demands such extended treatment, that in this column we can do no more than from time to time hint at it. Yet a definite answer to this question is being more and more frequently asked for by persons who have every right to be answered; and if those interested in manual training are not prepared to state decidedly what is right and what is wrong, they must not be surprised if the matter is settled without their help, and perhaps in a way prejudicial to their personal interests and the still more important interests of education. Briefly stated, the crude proposition is this: Shall scholars in school hours do work which has a money value, so long as such work fits in with their educational development? To this question manual training teachers must be able to return a prompt and plain affirmative or negative; and further, it goes without saying, they must follow this up with convincing reasons for their simple Yea or Nay. It is a difficult and delicate question, but it must not be shirked; and they who answer affirmatively or negatively must receive equally patient hearings. In accordance with our British traditions a certain amount of compromise for, perhaps, years to come is inevitable, but the thing will gradually get settled. It is a racial characteristic of ours to get something, however little, *done*. And it appears to us that, bit by bit, the handiwork of scholars in all schools will consist, as far as possible, of work which possesses definite commercial value; that constructive efforts will often take the form of real things and not be imitations of real things; in short that children will prepare for life by taking an actual part in the activities of the community from the very commencement of their school life. But always the work will be for the child's sake, and not the child for the work's sake.

A School not A Factory

Let no one imagine that we wish to turn the school into a factory, or that our chief aim is the production of things instead of the making of citizens. Against aught that would imperil the birthright of the child we shall raise and maintain our protest. A child's chief right is the right to play, but, then, his play is sometimes more seriously important than our work, and, so long as we do not inflict monotony and repetition on him, there is much that we call work which he would regard as play. We would safeguard in every way the true education of the child; we should contemplate with horror any suggestion to set up factory conditions in our schools; we would shun as a leper any man who set out to make money by the exploitation of child labor. We repeat, it is in the making of citizens and not of things for which we are concerned. But there is no reason why we should not make our citizen very largely by setting his hands to the making and doing of things. Real things, too! Boats he can float in, chairs he can sit on, roofs he can shelter under, carts he can ride in, not forgetting toys he can play with. It is difficult in few words to convey a just impression of our meaning. We must, as every writer must, rely greatly on the side knowledge and sympathy which enables our readers to understand us more by what we hint at than by what we state. A clever schoolmaster asked an able assistant mistress what she had got that bunch of grass for. She replied that she was going to give the children a talk about haying. He rejoined that she was going to do nothing of the kind; if the children were to learn about haying they should *go* a-haying. And they *did* go, into the nearest farmer's field. This incident illuminates our argument. Arithmetic is being taught by actual shopping; geography by actual school journeys; cooking by the actual production of saleable pies and puddings, We cannot get away from these facts, and the manual training in wood, metal, or what else, has got to get on similar practical bases.

—H. WILLIAMS SMITH, in *The Schoolmaster*.

Manual Training More Practical

If there is one criticism on the work now being done in our public school manual training shops that is heard more frequently than another it is that it is not "practical" enough. There is used a more or less stereotyped form even, and it is now almost a common experience to see or hear derisive references to "the-coat-hanger-and-necktie-rack-type" of manual training. Certain of these disparaging comments have received attention because of the weight of the signatures subscribed to them, others, it may be inferred, because of their vehemence of utterance. Waiving the question of the interpretation of "practical," the very fact that manual training is assailed on this ground arrests attention. Surely shopwork and mechanical drawing should be practical if they are nothing else.

So far as these flings at manual training are justifiable, of course, the work cannot be defended, and ought not to be. Wherever the

grammar school and high school woodworking is carried on in such a way that it fairly merits the characterization "dilettante dawdling with tools," or "in the main abstract, isolated, impractical, and unsocial," there should be prescribed for the shop a housecleaning and for the teaching force enlightenment. Those who are responsible for the character of the work done in the name of manual training should study these criticisms and, if they commend themselves as rational and sound, they should test their work by them.

Abundance of Material Available

Supervisors and instructors should be constantly alert in seizing opportunities for the improvement of their instruction, and receptive to new ideas from all possible sources. In these days of frequent teachers' meetings, widely circulating periodicals, and cheap books there is no excuse for shop courses remaining dry and uninteresting and instructors "uninspiring" and "wooden in their intelligence." Compared with other school subjects manual training is new, and there are few traditions that need hamper the instructor. New ground is being broken every month. The instructor who is alive and growing will put something entirely new into his outline each year, and keep the work closely related to the interests of the pupils he teaches and of the community he serves.

—WILLIAM T. BAWDEN.

ASSOCIATIONS

NATIONAL EDUCATION ASSOCIATION.

The meeting of the Department of Manual Training and Art at the National Education Association Convention in San Francisco, July 8-14, 1911, was the largest that the Department has ever held. We were just a bit skeptical regarding the location of the Department headquarters so far from the general headquarters, but we found after being there a day or two that it was almost impossible to have matters arranged differently. However, it was extremely inconvenient and there was never a time during our session that we had sufficient seating capacity. We were given a royal welcome to the Golden State, a state which has stood for great things and royal welcomes from the present time back to the days when the weary seekers after gold crossed desert and mountain that they might arrive there.

The opening session (Tuesday morning, July 11th) was called to order by Dean Clifford B. Conelley of the Carnegie Technical Schools, Pittsburg, Pa., President of the Department of Manual Training and Art, who read a paper on the topic "To What Extent Does Manual Training Aid in Adjustment to Environment?"—emphasizing the great influence that manual training has in helping the average pupil to find himself and to fit himself for his future occupation.

The next paper on "The Dynamic Value of Manual Arts in the Public School System of Education" was prepared by Prof. T. D. Sensor, Department of Public Instruction, Trenton, N. J., and read by Cree T. Work of Texas. This interesting paper discussed the actual and effective part taken by the manual arts in public school work in helping to find the proper and most valuable curricula for many types of pupils.

The third paper on "The Requisites of the Efficient Teacher in Industrial Schools" was prepared by Dr. Geo. W. Gerwig, Secretary of the Board of Controllers, Allegheny High School, Pittsburgh, Pa., who, on account of a serious accident, was not able to be present. His place was taken by J. M. Berkey, Pittsburgh, Pa.

Mr. Gerwig considered the relation of the industrial teacher to scientific management and to education as a whole. "The distinctly American educational ideal," he said, "may be summarized in eight words: Education is training for service, and in service. It demands (1) that every pupil be trained to develop all his powers; (2) that this training be dedicated to some superb service for his fellows."

These three papers were discussed by E. A. Ross of El Paso, Texas, in place of James E. Addicott of Oakland, Calif., who was unable to be present, and by Pres. F. L. Campbell, University of Oregon, Eugene, Ore., followed by open discussion in which many participated.

The report of the Committee on College entrance Requirements of which Arthur L. Williston, Director of Wentworth Institute, Boston, Mass., was chairman, was then presented. This committee deserves a good deal of credit for the

work it has done and the good it has accomplished. It will, however, be a hardship to continue these investigations on account of the dictatorial methods of the Finance Committee. Considerable money was spent last year by the members of the Committee and this year an appropriation was asked to cover the expense of postage and stationery. This modest request was refused. I do not wonder at the growing dissatisfaction within the N. E. A. when a few persons will take hold of the reins and pull them so tight that you have to be one of God's "chosen people" to get anything in the way of help.

The Committee accomplished far more within the past year than was ever anticipated. The higher institutions of learning, without a single exception, are willing to give full credit for the work done. In order to bring the whole matter officially before the bodies, its investigations must be completed, but when an appropriation was asked to continue the same, not even a hearing could be secured. But we are going ahead in spite of this handicap and I believe we shall eventually accomplish what we have started out to do.

The second session of the department was held on Wednesday morning, July 12th, when Paul Kreutzpointer of Altoona, Pa., read a most scholarly paper upon "The New Standards of Present Day Industrial Education in Europe," presenting to the department the latest developments along this line in Europe as worked out by Dr. Kerschensteiner and others. He called attention especially to the remarkable cooperative spirit pervading all classes of society when it comes to making sacrifices for the technical education of the people, and to the democracy in the use of educational methods which secures and vouchsafes the widest distribution thruout the mass of industrial workers of industrial intelligence, economic insight, the conception of civic obligaion and public spirit.

Miss Helen Louise Johnson, Associate Editor of "Good Housekeeping Magazine," N. Y., presented the next paper on "The Requisites of effective teaching in Manual Training and Household Arts" in which she stated that the chief requisite for the efficient teaching of manual and household atrs is the teacher who possesses the three vital requisites of interest, methods and a few facts.

The third paper of the session was read by Alfred Guillou of Berkeley, Calif., who discussed very thoroly "Present Problems in the Literature of the Manual Arts and Vocational Education." A lively discussion of these three papers was participated in by Louis B. Butler, of San Jose, Cal., Miss Mathilda G. Campbell of Toledo, Ohio, Prin. Geo. A. Merrill of San Francisco, Calif., and others.

The third session of the Department was held Thursday morning, July 13th, this session being devoted wholly to the subject of Home Economics. "The Public School Domestic Science Department as an Influence in the Community for Enforcing the Observance of Pure Food Laws, Civic Cleanliness, etc." was the subject of a thoroly interesting paper by Miss Matie P. Clark of Oakland, Calif., who called attention to and gave some instances of the civic value and influence of the public school domestic science departments in a community.

Miss Etta P. Flagg of Los Angeles, Calif., discussed in her paper "Some Actual Needs for Intelligent Purchasing of Household Commodities and Practical Methods for Keeping Household Accounts."

The report of the Committee on Nomenclature was made by Miss Ednah A. Rich, President of the State Normal School of Manual Arts and Home Economics, Santa Barbara, Calif. This report will be published in the annual proceedings of the N. E. A.

Discussion of the papers was opened by Wm. R. Snyder of Hollywood, Calif., who sustained Miss Clark's plea that our education should be practice, not theory. The conservation of home is not alone the work but the duty and privilege of the home economics teacher. Miss Harriett A. Boyer of New Orleans, La., discussed Miss Flagg's paper, stating that "We must have knowledge. We are forced, the most of us, to buy those things of which we know nothing. Factory prepared foods are constantly on the increase and it demands constant watchfulness, added to a good basic training to protect the family. There should be a standardizing of weights and measures, but not only in a few states but in all states." Dr. Corwin of Pueblo, Colo., continued the discussion and emphasized the necessity of sterilization and the dissemination of knowledge concerning it. He said, "We never can have sanitary inspection except from the States and the United States." He then emphasized the necessity of more and more knowledge concerning flies and upheld the wonderful work of Dr. Wiley at Washington.

At the close of this session, the following officers were elected for the year 1911-1912:

President—Dean C. B. Connelley, Carnegie Technical Schools, Pittsburgh, Pa.

Vice-President—Miss Isabel Bevier, President of the Home Economics Association, Urbana, Ill.

Secretary—Mr. W. A. Dunn, Principal, Polytechnic High School, Los Angeles, Calif.

The last session of the department was devoted to art education in the public schools and was presided over by Prof. A. B. Clark of Leland Stanford University, who read a scholarly paper upon "Art Education in the Public Schools, an Essential of Civic Perfection."

Cheshire L. Boone of Montclair, N. J., followed with a paper on "Art's Service as a basis for Classified Knowledge" in which he admirably set forth the work of art in scientific development. The closing paper on "What Has Art in the Schools Done to Preserve and Cultivate the Imagination," was read by Miss May Gearhart of Los Angeles, Calif., who showed that art properly taught stimulates and cultivates the imagination, leading eventually to invention. She emphasized exercises in design, landscape, and pottery as especially stimulating to the imagination and leading to the glorification of common things.

The discussion of these papers was opened by Miss Katherine M. Ball of San Francisco, Calif., who raised the questions "Are We Teaching Children the Appreciation of Art?" and "Can We Do So?" She urged the awakening of an art spirit leading to and resulting in genuine art feeling.

Dean Connelley continued the discussion and was followed by Mr. Clark who urged the development of Art attitude in the children. Art exhibits, public parks, organ recitals were mentioned as valuable in awakening the artistic spirit. He mentioned as one reason for the slow progress of art, the general atmosphere of the industrial age. Miss Harriett N. Morris of San Diego, Miss Clara Robbins of Billings, Mon., and Mr. Kreuzpointner continued the discussion.

Miss Helen Louise Johnson acted as Secretary and, I am sure, the success of all the meetings was largely due to her effective efforts.

A memorial meeting for Mrs. Ellen H. Richards of Boston was held, Miss Isabel Bevier of Urbana, Ill., presiding. I only wish that all of the household arts and manual training people in this country could have attended this meeting. Supt. Keyes and Mrs. Andrews and many others spoke of the work which she had done and paid glowing tribute to a woman who has made more sacrifices for the advancement of this work than any other person, and how glad they were to be present and to have been an associate of this wonderful woman.

It was agreed at the business meeting to send a letter to each of the state superintendents and get the names of the schools having departments of manual training and arts, to which will be sent circular letters for their ideas upon the advancement of the work. As to the domestic science and art and manual training, the vocational side of the work has grown so rapidly that cooperation from every state is needed to make the work successful. If this Department continues to grow as rapidly as it has, it might be wise to meet in February, at the time of the Superintendence Meeting, when the Executive Council also meets, so that it shall be able to accomplish more, and can more effectively work out the scheme of cooperation.

—C. B. C.

NATIONAL SOCIETY FOR THE PROMOTION OF INDUSTRIAL EDUCATION.

We believe that everyone who attended the fifth annual convention of the National Society for the Promotion of Industrial Education in Cincinnati, November 2d, 3d and 4th, felt well repaid for going. The rich and varied program, the opportunity to study Cincinnati's school system, and the cordial treatment at the hands of the school people and the manufacturers made the meeting a memorable one. The first session was appropriately given to a presentation of "Cincinnati's Experience in Industrial Education." The second was given to the question, "How shall the Obligation to Provide Industrial Education be Met?" the third to "What Types of Continuation Schools are Most Needed under American Conditions?" the fourth to "What Can be Done for the Factory Worker Through Industrial Education?" the fifth to "Industrial Education Necessary to the Economic Development of the United States;" and the last to "Should Trade Schools for Youths Above Sixteen Years of Age be Provided at Public Expense?"

Every one of these questions was discussed in several of its phases by men who were especially qualified to speak on them. Among the addresses that seemed to stand out prominent in our minds after the meeting was all over were Charles A. Prosser's remarkably clear presentation of the problem of the factory worker, Arthur L. Williston's presentation of the evening school situation, and the discussion of the trade school by Carroll G. Pearse and George M. Forbes. Two addresses at the banquet, also, are to be remembered: one by H. E. Miles, a Wisconsin manufacturer, and the other by Frank Duffy, a representative of organized labor. A full report will doubtless be published by the Association

in the near future. In these few paragraphs we can only point to some of the statements that attracted our special attention.

It was at the banquet on Thursday evening that James P. Munroe, president of the Association, told the story of a parent who brought his little boy to the church for confirmation. The priest asked, "Has he been baptized?" "Yes," was the reply, "but it didn't take." Mr. Munroe continued, "too often in education we merely scratch the surface, and it does not take." "We have been so afraid that we would not give every boy an ideal chance that we haven't given the great majority any chance at all." Later in his address Mr. Munroe emphasized the fact that "the greatest enemy of the laborer is industrial ignorance." This was strikingly similar to the opening of Mr. Duffy's address in which he said "'To earn more, learn more.' That is what the labor unions have been doing for the past twenty-five years."

Mr. Duffy made it perfectly clear that the labor unions are in favor of industrial education, and he made it equally clear that they insist that such education must come under the direction of the public school system, and not under a private school that "charges high tuition and turns out a plasterer in two months, a mason in five months, and a carpenter in six months." He said emphatically, "Organized labor is not opposed to industrial education in public schools." "We have a voice in the public schools. The public schools should not be mixed up with questions of capital and labor." Students should take no part in labor disputes, and any student disobeying in this respect should be expelled. The manufacturer, too, should not use students in times of strikes or lock-outs. Mr. Duffy took advanced ground when he said that labor unions ought to give trade school students credit on their apprenticeships.

In discussing the question of support Mr. Duffy said that the laborer is not the only one benefitted by industrial education; the employer, too, gets some benefit. The educated mechanic is of some value to the community, to the state and to the nation. Hence the public should pay the bill.

Some of the figures given by Mr. Williston concerning evening schools were a surprise to many. After showing graphically the rapid development of such schools in the United States, and estimating that the total number at the present time is 500,000, he stated that in Germany the enrollment in evening schools has at times exceeded the enrollment in day schools. As an illustration of what is possible he pointed to Springfield, Mass., where twenty per cent of all the pupils between fourteen and twenty years of age are in school. He also pointed out that in New York City alone there are 109,000 enrolled in evening work and that in the Y. M. C. A. schools of the country there are 52,400.

State Superintendent Carey of Wisconsin would not have pupils between fourteen and sixteen years of age compelled to go to night schools, tho he believed in compulsory continuation school laws. He would guard the pupils' physical well-being. He said that the indoor life of manufacturing is telling upon the physique of the present generation, and the next generation will have to make a great effort to build it up if it is allowed to be broken down in this generation. With this in view the Wisconsin law provides for five hours a week off from work for pupils to attend continuation schools. Edwin G. Cooley emphasized this point by stating that England is already confessing that she is

making a mistake in using only the fag ends of a boy's energy for school work. The evening schools should be for boys over eighteen years of age; the boy of fourteen needs protection.

Another phase of this subject was brought out by Frank M. Leavitt who did not believe in compulsory evening schools, yet he did not see why compulsory study in the evening hours was any worse for a boy who has been working at drudgery all day than is compulsory study in the evening for the boy who has been in school all day.

The most important single piece of work done by the convention was the acceptance of the report of the special committee appointed to consider Senate Bill No. 3, known as the Page bill. A printed report, which is the result of months of study, was ably presented by Commissioner David Snedden, the chairman of the committee, and unanimously adopted. This report suggesting some changes in the bill and giving reasons for them will be brought to the attention of the members of Congress.

Another feature of the business meeting was the receipt of a bank draft for $1,000 from the Metal Trades Association of Cincinnati to help defray the expenses of the Association during the coming year. The officers elected were president, W. C. Redfield, vice-president of American Blower Co., Brooklyn, and Congressman for the sixth district of New York; vice-president, Howell Cheney of Cheney Brothers of South Manchester, Conn.; treasurer, Frederick B. Pratt, Pratt Institute, Brooklyn, N. Y. —CHARLES A. BENNETT.

BOSTON MANUAL TRAINING CLUB.

The regular meeting of the Boston Manual Training Club was held on Saturday, October 14, at the club camp at Riverhurst. This it the important business meeting of the year at which time reports from the out-going officers were read and the new officers installed. A fine camp dinner was provided by the Club's own chefs and a very enjoyable time is reported.

WISCONSIN SCHOOL ARTS AND HOME ECONOMICS ASSOCIATION.

The plan of this association which provides for two meeetings, one held in April and one in November, has been working out with great satisfaction to the members. The program for the November, 1911, meeting includes the following topics: "The Function of Manual Arts in Modern Education," by W. T. Stephens, State Normal School, Milwaukee; "Functions of the School in the Problem of Home Making," by Mrs. T. W. Youmans, member of the State Board of Normal School Regents; "Beauty in School Work," by Henry Turner Bailey; "Relation of the Present Movement for Vocational Education to the Teaching of the Mechanical Arts," by Frank M. Leavitt, Universiy of Chicago; "Handwork in Primary Grades," by Mrs. S. H. Harris, State Normal School, Milwaukee; "Picture Study in Elementary Schools," by Miss Ida M. Cravath, Madison; "A Practical Course in Drawing in Smaller Towns," by Miss Marian Gregory, Beloit; and a round table discussion on the general topic "What Knowledge of Home Economics Should Girls Acquire in School?"

The Iowa Manual Arts Association has adopted a plan that might prove equally useful to other associations that have not reached the point where it is possible to publish an annual volume of proceedings. This Association, thru the cooperation of its members, issues the papers, which are read at the annual meeting, in mimeograph form. Enough copies are printed to supply one set of the papers to each member of the Association.

At the meeting of the Military Tract Teachers' Association held in Peoria, October ninteenth, twentieth and twenty-first, Dean Davenport of the University of Illinois said that we are not going to change the fundamental activities by education. We shall still want plumbers, carpenters, etc. Our business as educators is not to educate children out of these industries but in them. The public schools should turn the boys back into the industries. The purpose should be not to allow a child to get out of school without having this vocational appeal made to him. The boy ought to be "tried out" in the upper grammar grades and in the high school. "Let us stop drawing a line between what is mental and what is manual in education; it is a damage. I have found that all people who do things well—skillfully—have good brains and use them. I found it just as hard—required just as much brain to dig a ditch as to do my work at the University." "Don't think that every boy who does not graduate is lost. Many who have gone to the high school and the university would have been better off and it would have been better for everybody concerned if they had stopped school at the end of the grammar grades."

The Manual Training Round Table of the Kansas State Teachers' Association held a very successful meeting at Topeka on the 10th of November. The most important action of the meeting was the appointment of a committee to formulate courses in the manual arts for presentation and discussion at the next meeting. Dr. George E. Myers of the Pittsburg Normanl School was made president for the coming year.

SHOP PROBLEMS

GEORGE A. SEATON, Editor.

MICROSCOPE BASE.

A very simple piece in woodworking is the base for a microscope shown. An inexpensive microscope can be mounted upon a rod which is placed in the hole at the back, while the object to be examined is laid upon a glass slide and illuminated from below.

CLOCK SHELF.

Many classes undertake the making of a clock case in which to place a cheap alarm clock. Mr. Hans Schmidt of St. Paul has carried the problem one step farther by designing a suitable shelf for such a clock. The construction shown in the drawing may be followed or the joints can be lapped or tenoned.

BOOK STAND.

A variation of the more or less familiar set of book shelves is given in the design of D. K. Hiett of Kane, Pa. As this was worked out in Mr. Hiett's first year in high school classes the joints were held together with glue only. This necessitated a very accurate fit.

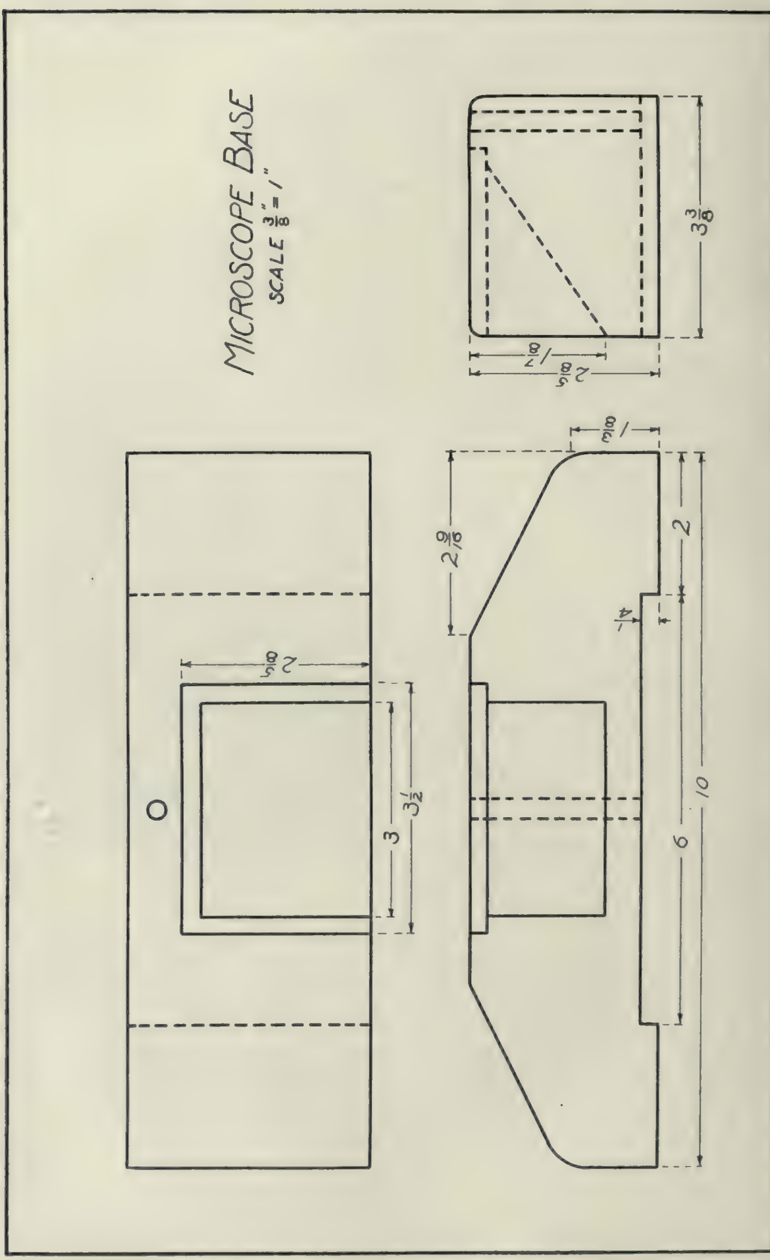
BOOK STAND.

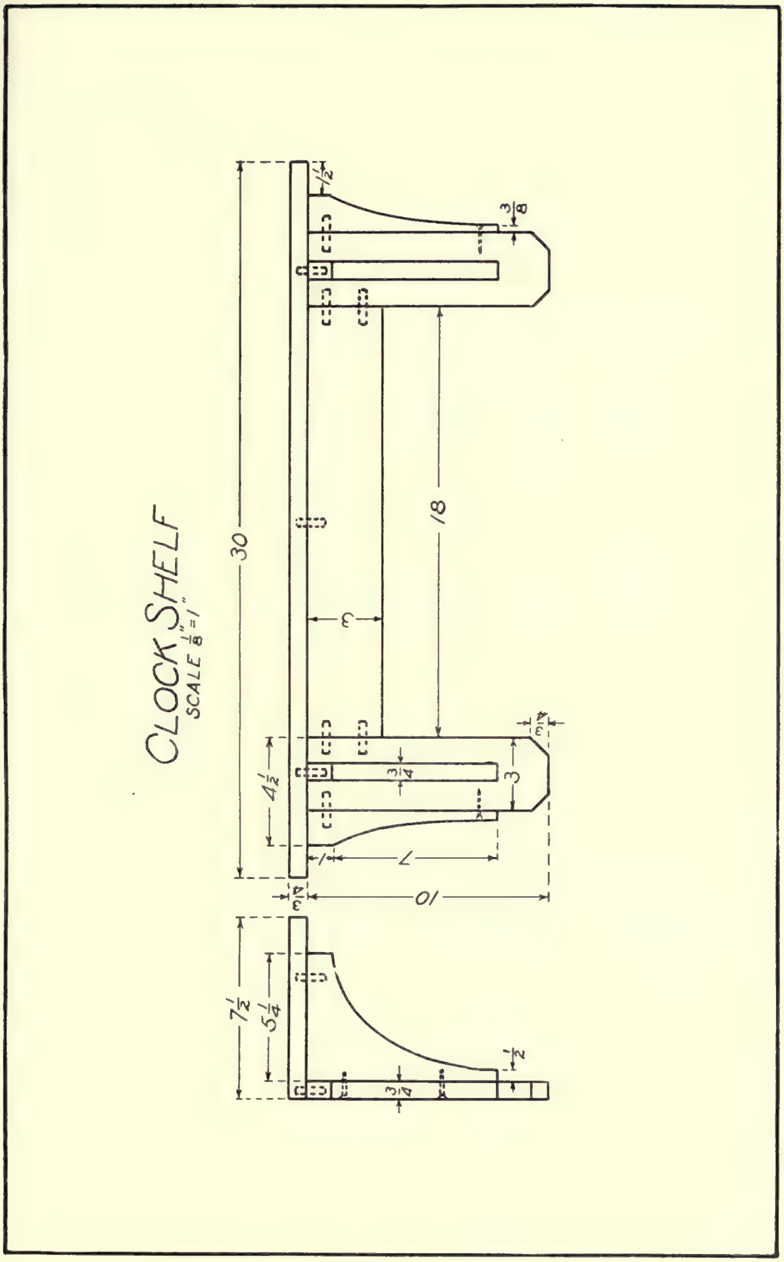
WRITING DESK.

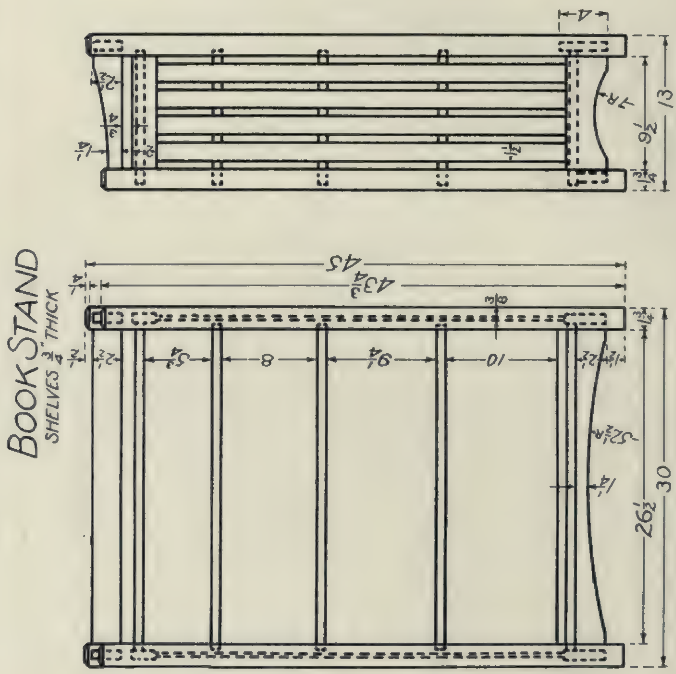
This pleasing design for a writing desk is by F. V. Gill of the Boy's High School, Reading, Pa. Its construction is quite similar to that of a library table, the variation being secured by the addition of a set of pigeonholes. Possibly it might be an improvement to make the lower cross-strip somewhat narrower and place it nearer the back legs of the desk. Its function would thus be changed from a shelf to a strengthening brace, and by the alteration greater room beneath the desk could be secured.

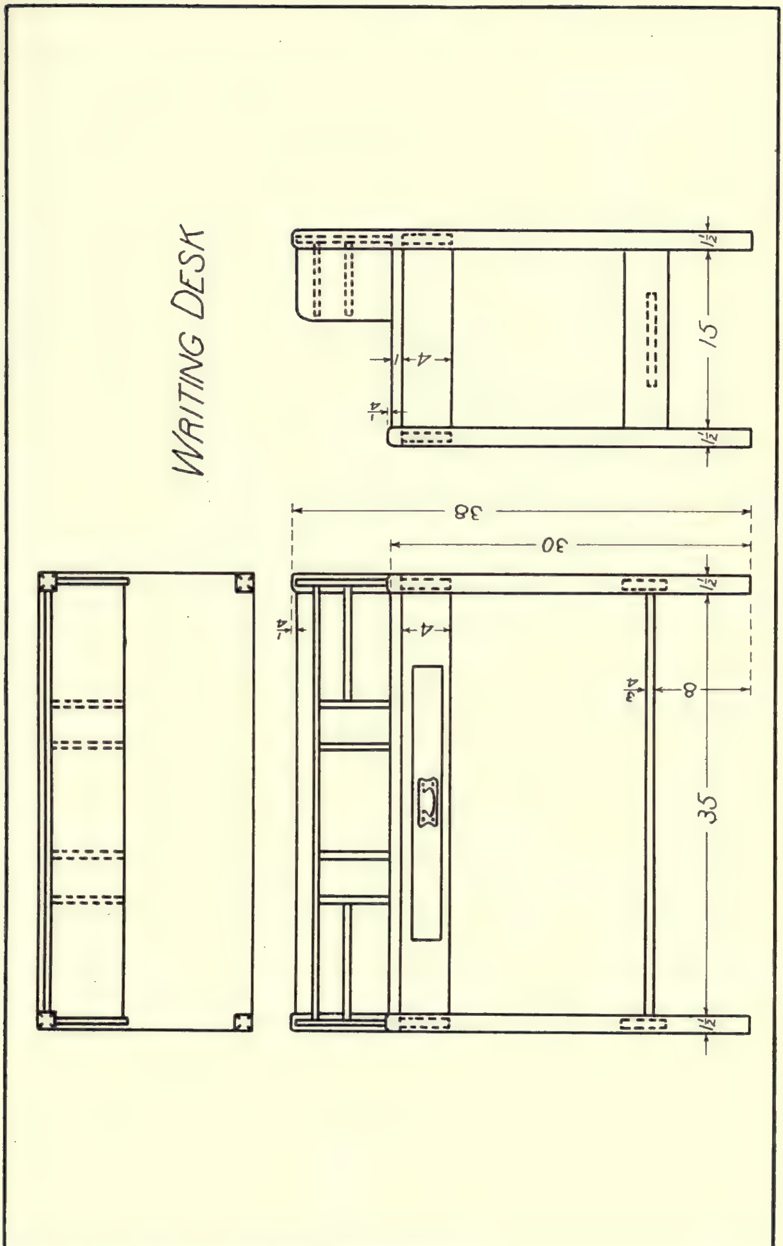
PHOTOGRAPHIC TRAY AND NEGATIVE RACK.

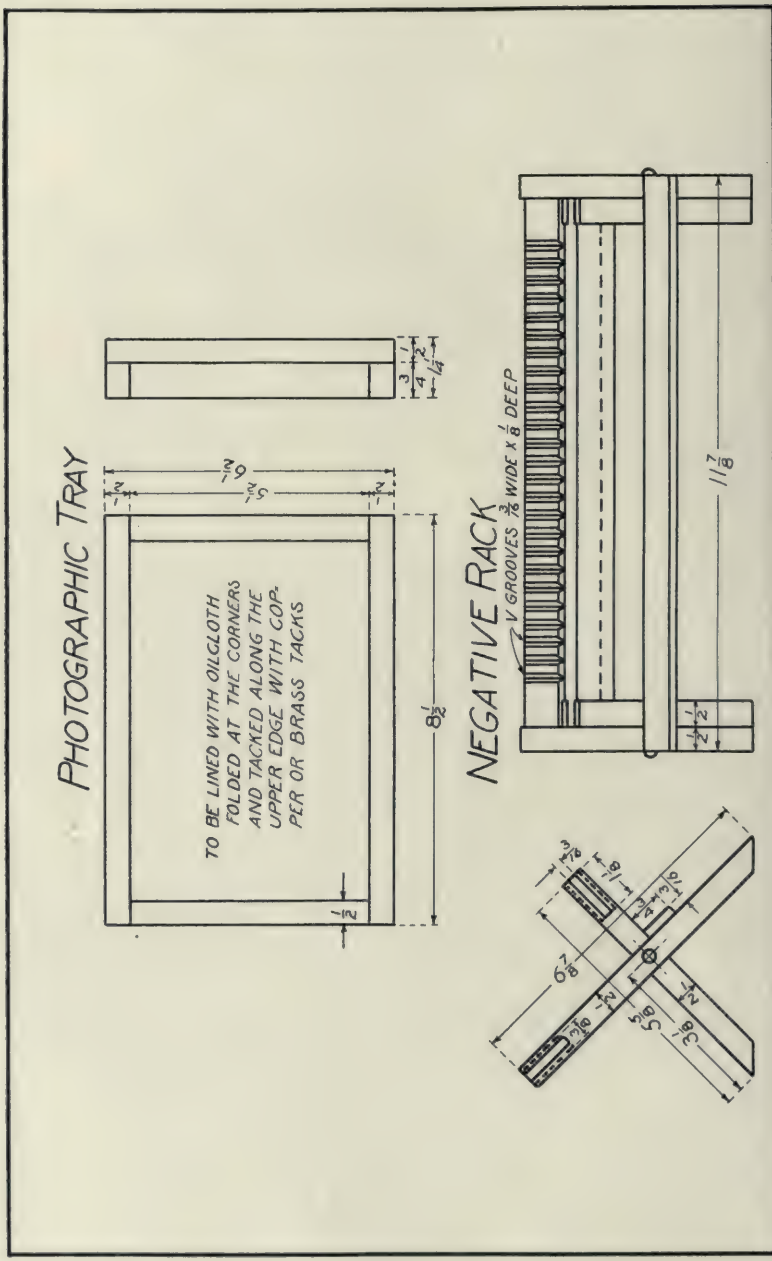
Any of the boys who might have been tempted to construct the pinhole camera presented in the October number would soon find other accessories needed.


MICROSCOPE BASE
SCALE 3/8" = 1"

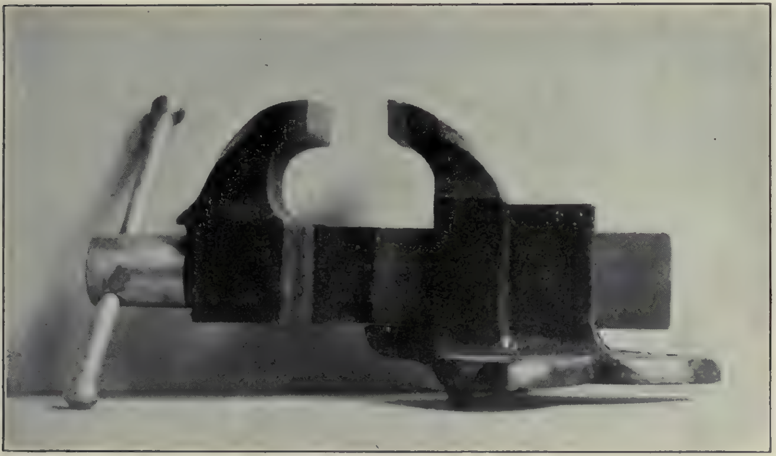

CLOCK SHELF
SCALE 1/8" = 1"


BOOK STAND
SHELVES 3/4" THICK
45
43 3/4
30
26 1/2
13
9 1/2
8
10


WRITING DESK
38
30
15
35
4
8
1½


PHOTOGRAPHIC TRAY
TO BE LINED WITH OILCLOTH FOLDED AT THE CORNERS AND TACKED ALONG THE UPPER EDGE WITH COPPER OR BRASS TACKS
NEGATIVE RACK
V GROOVES 3/16 WIDE X 1/8 DEEP

Two of the first required are shown in the drawing. The tray is a shallow box lined with oil cloth which is held in place by some non-rusting tacks along the upper edge. Such a tray will prove very serviceable and for the larger sizes which are necessary in enlargements, the economy will be quite a point in its



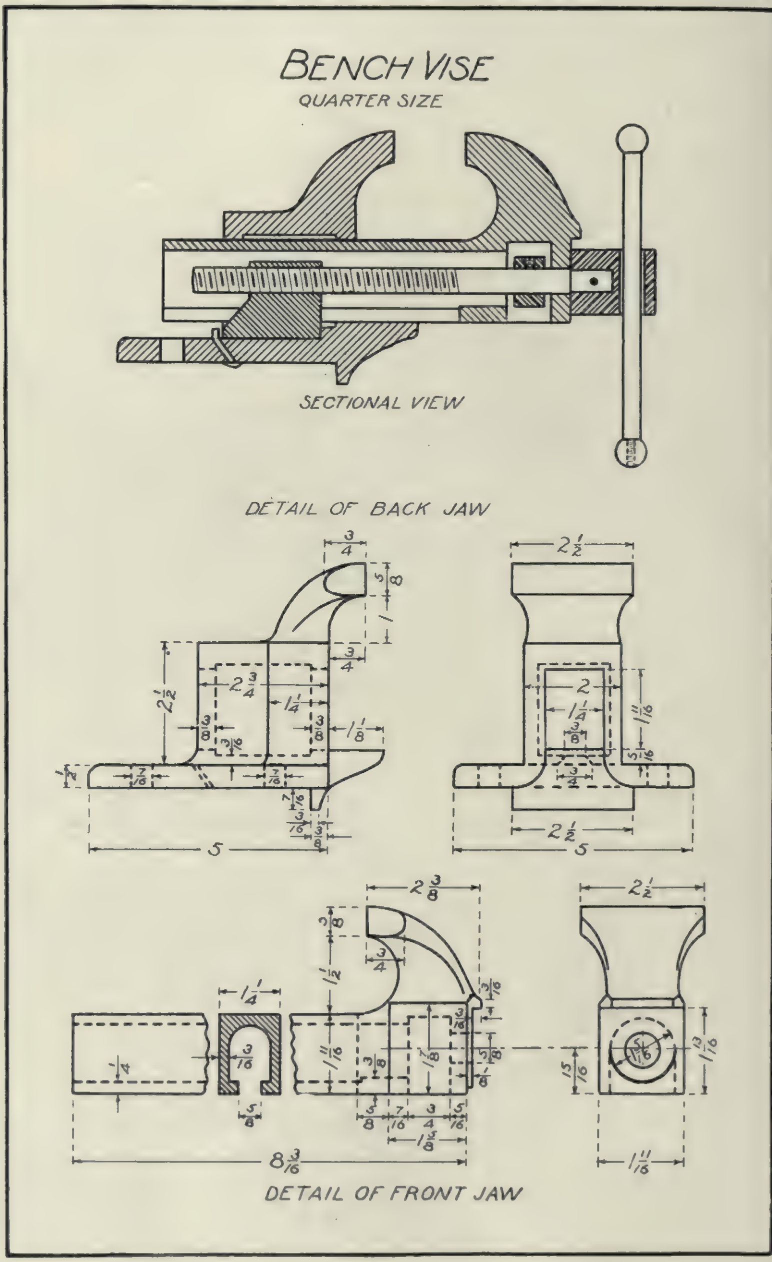
BENCH VISE.

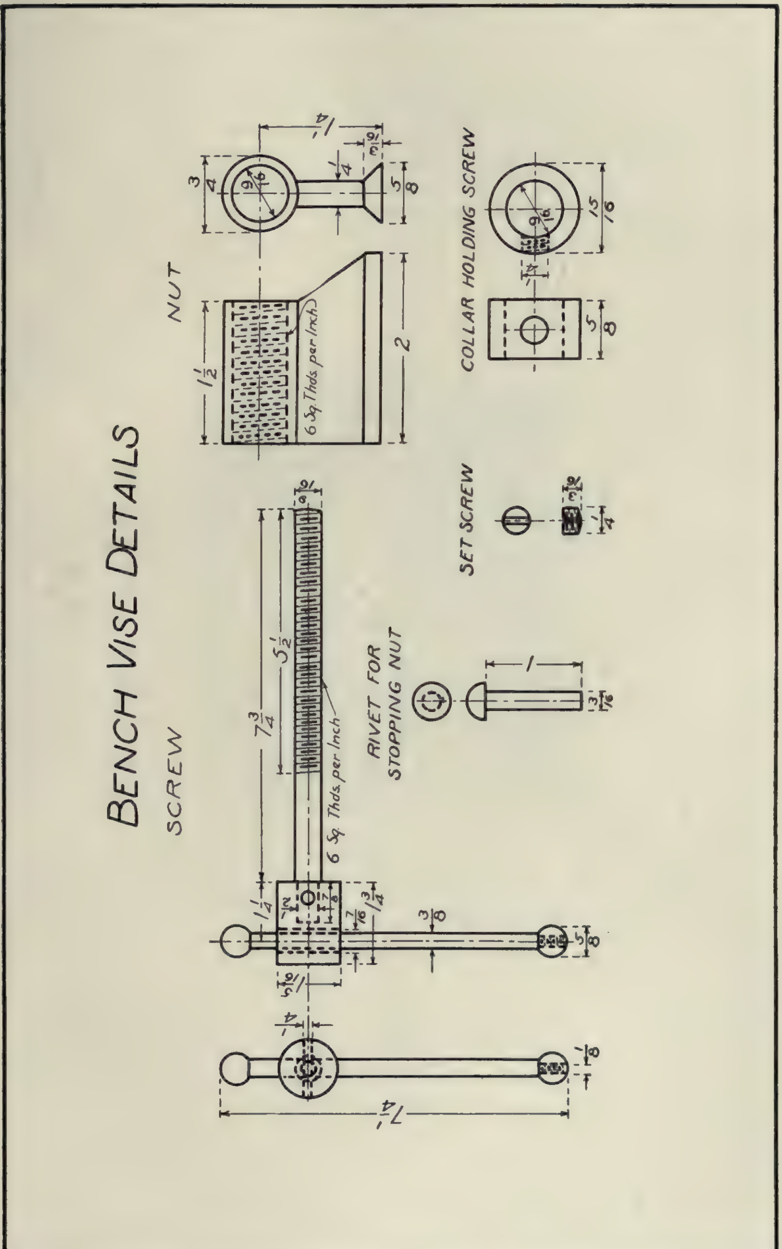
favor. A tray of the dimensions given will allow the developing of two plates at a time of the size used in the camera shown in the former number of the magazine. Four ounces of developer will be sufficient for this tray.

After the negatives have been developed, fixed, and washed it will be convenient to have some place in which they can be easily and evenly dried. The rack shown has grooves to hold twenty-five negatives, but it will be found better not to place the negatives quite so close. Perhaps no more than ten or eleven should be dried at a time. When not in use the rack can be folded flat, the two halves hinging about round-headed screws.

BENCH VICE.

More problems of this type would be welcome in the department, yet they seem hard to secure. For the most part the construction is clearly shown in the detail drawings given, but where there is any trouble in understanding these, as in the case of the shape of the base of the back jaw, the photograph will be found helpful. The design is furnished by Wilson H. Henderson of Springfield, Illinois.


BENCH VISE
QUARTER SIZE
SECTIONAL VIEW
DETAIL OF BACK JAW
DETAIL OF FRONT JAW


BENCH VISE DETAILS
SCREW
6 Sq. Thds. per Inch
NUT
6 Sq. Thds. per Inch
RIVET FOR STOPPING NUT
SET SCREW
COLLAR HOLDING SCREW

AID FOR SAW-FILING.

The problem of saw-filing is one that is seldom entrusted to grammar or high school pupils, for the saw is apt to be left in worse condition than it was originally. Mr. Masters of Central Manual Training School, Cleveland, has been enabled to secure much better results by the clever expedient illustrated in the photograph. By utilizing a laboratory support, a strong reading glass can be held in position above the saw-clamp, enabling a magnified image of each tooth to he seen as it is filed. The results of the filing are thus made so evident that surprisingly good work is produced.

SAW FILING.

CURRENT ITEMS

NEW ENGLAND STATES.

Saturday morning classes have been arranged at the Boston Sloyd Training School of which Gustaf Larsson is principal. The courses offered are benchwork, wood-turning, bookbinding and metalwork. Short talks are given on the respective merits of industrial and educational methods of manual training.

The purpose of these Saturday classes is, first, to give graduates of the school opportunity for special work and for work demanded in their respective schools; second, to offer teachers who are contemplating specializing in manual training an opportunity to ascertain their fitness for the work; third, to give to supervisors and teachers engaged in regular school work an opportunity to gain an insight into the merits of the methods of sloyd, as superior to the so-called industrial methods.

The manual training teachers of Springfield, Massachusetts, are taking up the study of certain phases of the Taylor system of scientific management in their department meetings this year. That part of the system which deals with the economy of time will be considered in its relation to the management of a manual training system. Making decisions quickly, the avoidance of useless motions, and similar topics will form an important part of manual training instruction when the teachers have become familiar with the principles of the Taylor system. Other schools have taken up the subject with interesting results.

The New Hampshire State Teachers' Association at its annual business meeting in October passed an interesting resolution in regard to the manual arts and vocational studies, which recommended the extension of courses in agriculture, domestic and mechanical arts. It also recommended that the colleges of the state recognize the fundamentals of high school curricula in entrance examinations and give encouragement to distinctly practical vocational courses.

The Durham State College took immediate action on the matter. As a result three out of fifteen units required for college enrance may represent high school work in vocational subjects, if taught in an approved high school, and if properly certified.

A movement is on foot in Massachusetts which has for its aim the establishment of a free university for New England which shall have extension courses, carrying opportunities into every section of this group of states.

To this end a bill has been passed by the legislature of Massachusetts, directing the state board of education "to investigate the matter of improving and making more uniform the education now furnished by the various high schools in the commonwealth and also of providing higher and supplementary education as a sequel to the public school education now provided." A number of institutions of learning in the state receive support from the state but at present the state Agricultural College is the only one whose policy is controlled by the state.

This school is unable to accommodate the number of applicants each year. A university on the liberal, practical lines of the Middle Western universities is the type in the minds of the people who are interested in this movement.

At Burlington, Vermont, additional manual training equipment has been installed in a room in the basement of the high school. The entire equipment consists of twenty-four benches for woodworking, seventeen wood-turning lathes, a lathe for the instructor, and a twelve-inch circular saw, a band-saw, and a planer. The machines are driven by a 5 h.p. motor, while the lathes are driven by continuous shafts with three 3 h.p. motors.

Two of the objects of the work to be done by the Vermont Women Teachers' Club, as recently announced, are the introduction of manual training and domestic science, and the development of interest in agricultural pursuits.

A course in manual training for grammar grade teachers is the latest development at Pawtucket, Rhode Island. This course will prepare these teachers to instruct the pupils in their grades in the subject. If the preparation is made thoro this is a step which should lead to that close correlation of studies under the one teacher which is the ideal of many educators.

The ninth grade boys of one of the North Adams, Massachusetts, schools are building a forge-shop. They are working out the plans with intense interest. When complete the building will be of brick, 60 x 32 feet in size, standing on brick piers. It will accomodate twenty forges. A platform will be built at one end of the room for the instructor, so that all demonstrations may be clearly seen.

MIDDLE ATLANTIC STATES.

New York's annual Budget Exhibit aroused much interest during October. Daily addresses were given and moving pictures of various methods of education used in New York were shown. Every effort is made to show the public just how and for what the school money is being spent. A review of the summer school work, which was the subject of one of the addresses, showed a remarkable growth in vacation school work. The average daily attendance last summer was 20,367, as compared with 4,260 in 1898. In the manual arts work over 12,000 baskets were made, 2,151 chairs were caned, and many articles for both home and school repaired. The girls completed 27,508 articles of various sorts in the sewing and millinery work.

In Reading, Pennsylvania, during the last week in October, a machine-shop was opened as part of the manual training department of the schools. The equipment of the shop consists of five lathes, two drill-presses, a grindstone and emery wheel, a shaper, twenty benches and a hack-saw. A combination forge with melting pot and muffler will be added soon. All pulleys and motors have been placed overhead. School seats and a blackboard have been arranged conveniently for class discussions.

The department in Reading already had benchwork, a turning shop, and a drafting room. Early in October three additional shops were opened for benchwork. A domestic science course for the girls was introduced this fall also. The work in Reading is certainly progressing. W. E. Hackett is supervisor.

The Paterson, New Jersey, manual training school will have roomy quarters in the new high school, moving in in December. Long-contemplated improvements will now be possible. Metalworking will be introduced and rooms will be equipped for wood-turning, pattern-making, general carpentry and joinery, forging, and machine-shop practice. The school has been in existence twenty-three years, undergoing many changes in that time, and adding many courses. Edwin D. Hilton has been director during the entire history of the school. The addition of metalworking this year will complete the mechanic arts course of the high school, and bring the school up to date.

At the Margaret Morrison Carnegie School for women at Pittsburgh the press of applicants for admission to both day and night courses has made the preparation of more courses necessary. These additional courses, open only to women of twenty-one or over, include millinery, given a two-hour period weekly for fifteen weeks; principles of dress-making in ten lessons; a tailored shirt-waist course of ten lessons; a course in costume design in twenty lessons; and a special course in cooking of twelve lessons. This last is strictly a practical course, which follows the rotation of family meals. Groups of foods suitable for breakfast, luncheon, or dinner are cooked at each lesson.

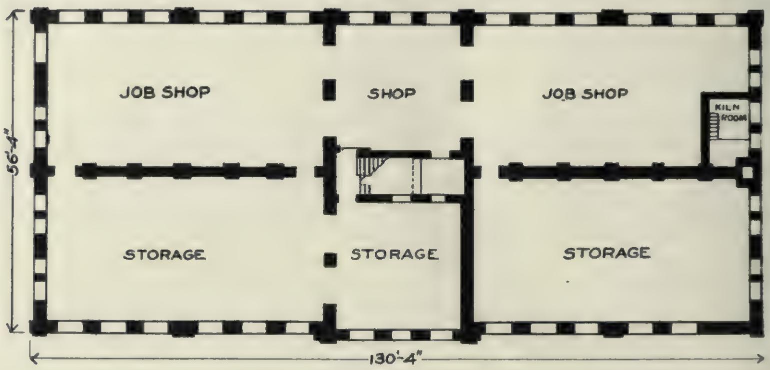
The manual training work in the elementary schools of Philadelphia has been extended to include benchwork. Ten shop centers have been opened for this subject in various schools of the city. Boys from neighboring schools will attend classes at the centers when the work has been tried out.

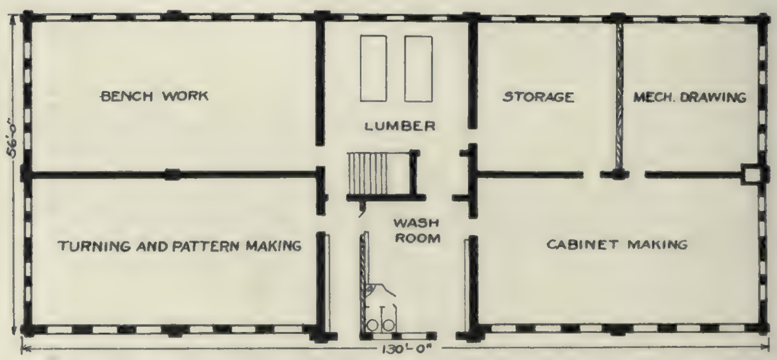
STATES OF THE MIDDLE WEST.

Among Michigan schools having improvements in manual training Grand Rapids is very much to the fore with three new shop buildings.

The grammar grade pupils from the whole city are to be brought together into a "central grammar school," a sort of junior high school. In connection with this school a two-story shop is in process of building which measures 130 feet by 60 feet, with a saw-tooth constructed roof. This building will be ready for occupancy in January, and will be arranged to include two rooms for benchwork, a mechanical drawing room, a pattern-making and wood-turning room, and rooms for stock, lumber, finishing, lockers, and wash room. Space will be left for enlargement as time goes on. Boys who do not expect to enter high school will be especially considered in planning future developments at this center.

In addition to this building, new shops are being equipped at the Central high school and at the Union high school. At the Central high, two shops are served from a lumber and preparation room. They are also connected with a





BASEMENT AND FIRST FLOOR PLANS OF NEW SHOP, CENTRAL GRAMMAR SCHOOL, GRAND RAPIDS, MICH.

large locker and wash-room. In the preparation room are the following machines: swing cut-off saw direct connected to a 5 h.p. motor, 12 inch jointer, 24 inch surface planer, saw-bench, and 4 inch four-side molder. The molder is motor-driven while the other machines are driven from a line shaft which in turn is driven by a 10 h.p. motor.

The cabinet-making room is equipped with twenty single benches and the following machines: 5 inch jointer, band-saw, saw-bench, jig-saw, and grinder with knife grinding attachment.

In the turning room there are ten pattern-makers' benches, a motor-driven pattern-makers' lathe with 16 inch swing and 10 foot bed, eight 4 foot wood-turning lathes driven by a 5 h.p. motor from a line, on which are mounted cone

pulleys direct on clutches, the shaft being supported in ball bearing boxes. The following machines are in this room: 5 inch jointer, band-saw, jig-saw, universal saw-bench, double-spindle shaper, and grinder.

The Union school shop equipment is similar to that of the Central school in woodworking, with the exception of eighteen motor-driven lathes in addition to the one large pattern-makers lathe in the turning room. Metalwork equipment is provided at this school for both machine-shop practice and forging. The forge-room is fitted with eighteen down-draft forges, Beaudry hammer, eighteen anvils, punch and shear, blacksmith's drill, and a gas furnace.

In the machine-shop are engine lathes, one speed lathe, planer, shaper, drill-press, sensitive drill, 24 x 8 x 17 miller, hack-saw, a wet tool grinder, a combination cutter, reamer and drill grinder. The engine lathes, hack-saw, sensitive drill, and milling machine are driven from a line shaft which, in turn, is driven by a 10 h.p. motor. The other machines are driven by direct connected motors.

The Grand Rapids schools, and the director of manual training, L. R. Abbott, are to be congratulated on the opportunities presented by these new quarters and liberal equipment. Mr. Abbott and his force of teachers, who have made the best of very crowded quarters in years past, are naturally enthusiastic over the prospects.

The manual training work in the Cincinnati schools is being supplemented this year by more intensive work at two schools, the Tyler and First Intermediate. At these two centers the pupils spend half the time in industrial work and the other half in academic work which is very closely correlated with the industrial. The woodwork begins in the fourth grade. At both schools is an educated mechanic who teaches the boys to do things in a "shoppy way." The boys work in groups with a foreman for each group. The work turned out shows a certain degree of skill of commercial value. The boys have made desk book-racks for all of the seventh and eighth grade teachers, and are engaged on looms, bookbinding presses, botany presses, window-boxes, and similar things, making them in sufficient quantities to supply the needs of the schools.

The work at these two schools differs from the regular plans in another way. The girls are taught enough woodwork to make them handy about the house, and the boys are taught cooking under the guise of "camp-cooking."

It is proposed to gather at these schools those pupils who show marked distaste for purely cultural subjects and at the same time a positive adaptability to industrial work. From such practical work as is in progress, these pupils should receive a more all-round development than is possible where their interest is not aroused.

Another innovation in Cincinnati is the model flat for the home economics department. Miss Charlotte Ulrich, instructor in domestic economy, will have charge of the flat, where the girls will be initiated, by actual living, into the various duties of housekeeping. Every phase of home-making will receive attention with practical demonstration. The first series of work-lessons will cover cleaning up the flat, painting floors, curtaining windows, and arranging the furniture. There will be a living-room, dining-room, kitchen, two bedrooms, and a bathroom.

Several improvements are reported in manual training from Springfield, Ohio. Two new shops for woodwork have been opened for the grammar grade boys, and two new shops in the high school.

EXTENSION WORK IN HOME ECONOMICS.

The Kansas State Agricultural College is conducting two lines of extension work in home economics which will prove interesting and suggestive to other schools. This work should result in an awakening among the women and girls of the state to the possibilities of better homes and better methods of home management. One of these new features of the college work is known as Home Economics Clubs, the other as Movable Schools in Cooking and Sewing.

The Home Economics Clubs are planned to assist girls and young women who are unable to attend the home economics department of this college or other schools. The purpose is "to give girls an idea of performing the everyday necessary tasks that are so often termed drudgery in a manner that will both lend dignity to the work and add interest to the worker." The plan is this: any group of girls from fifteen to twenty years of age may organize a club, the stipulations being that the club must have a regular time and place of meeting, must be in charge of some responsible person, must send to the college extension department a weekly report of work, and must report if the work is dropped. The department provides a suggestive form for a constitution and by-laws. As soon as the organization is complete the list of names enrolled is sent to the extension department office, with the fees, which amount to two dollars for each course for a club of less than ten, to two dollars and fifty cents for a club of between ten and twenty, and to three dollars for a club of twenty or more. When the enrolment is received the department at once sends the lesson sheets, one for each member for each lesson, with report blanks. The members of the class work out the lessons together if they have an equipped club meeting room, or individually in their homes if they have not. At the meeting the members report success or failure and the results are recorded on the blanks and forwarded to the office. The office also supplies pamphlets and direct information by letter when the need arises.

Three courses have been prepared in both cooking and sewing. Each course consists of twenty lesons. In sewing the first series of lessons teaches the elementary stitches in hand sewing; the second series consists of simple garment making and straight line drafting; the third course gives lessons in outer garment making, using ready made patterns. The courses in cooking cover the same ground as the freshman year of the college course. One course is devoted to special subjects.

The lesson sheets are simple and concise. The cooking lesson sheets when collected form a very valuable recipe book as the recipes are all tested.

Programs and exhibits are suggested by the department as a means of raising funds and to add a social element to the club-work.

The movable schools,, the second line of work carried on by the extension department, are a still greater departure from the usual routine of educational work. These schools are held for a week only in each place. One energetic

person in each community by interesting a few associates may soon arrange the organization necessary to secure one of these movable schools. A class must have at least twenty-four members and not over forty. No member should be under fifteen years of age. Each member must pay a fee of one dollar and if need arises fifty cents additional. Any girl or woman who signifies an intention of regular attendance may join such a class. The class must secure a suitable place of meeting and provide an equipment of at least one good range and a small two-burner stove, either gas or gasoline or oil, for every two members. Six or more sewing machines are required for the sewing work. Tables are needed which should be arranged to form a hollow square. The schools convene on Monday afternoon of the week selected, and close Saturday noon—regular sessions being from 9 a.m. till noon, and from 1.30 to 4.00 p.m. As a rule the morning session is devoted to cooking and the afternoon session to sewing. The instruction is provided by two teachers from the college, whose expenses are paid by the club or school.

The work for such a brief time must, of course, be intensive and demonstrational in character, but it will readily be seen that these short time schools will reach a large number of women of different ages and interests.

Correspondence courses are also offered in these subjects and in others under the head of home economics.

Several years ago George M. Pullman made a bequest of $1,200,000 for a manual training school at Pullman, Illinois, to be known as the Pullman Free School of Manual Training. The fund has increased to more than $2,500,000. A site of forty acres was purchased in 1908. In May of this year the next step was taken by appointing Laenas Gifford Weld principal of the school. Mr. Weld was until recently professor of mathematics and dean of the faculty of liberal arts in the Iowa State University. His present duties consist of investigations into the systems in use in the various trade and technical schools in this country and Europe.

Mt. Vernon, Indiana, comes into line with a department of manual training this year. The plan as outlined provides for the primary grades paper folding, paper-cutting, weaving, and clay modeling, with cardboard construction added for the third and fourth grades. The fifth and sixth grade boys have sloyd work while the girls are learning the elements of sewing. Beginning with the seventh grade the boys have benchwork on thru the high school. The girls have either sewing or cooking. A special teacher has been engaged for the boys' work, the grade teachers attending to the sewing and cooking.

The use of the manual training rooms in Gary, Indiana, schools is not limited to scheduled class periods. The rooms are open to students during all recreation and free periods, which are long and frequent, and are gladly used by such students as prefer the workshop to the gymnasium or playground. This privilege of working outside of class periods is denied the boys in many places, much to the detriment of interest and progress in the work. The good of the

individual, a happy daily living for each child, seems to be the constant aim of all departments of the work in Gary,. which has its effect in privileges such as this.

Manual training is a required subject for two years of the high school course at Evansville,. Indiana The high school has a machine-shop supplied with seven 14 inch lathes and one 20 inch lathe, a high power milling machine, a planer, and grinder, all individual motor driven, and a number of small machines such as a speed lathe, hack-saw, drill-press, and sensitive drill. The pattern-shop has a band-saw and six motorhead lathes. New lathes are ordered for the wood-turning room which will increase its capacity to eighteen. Eugene C. Graham is the new director, and Ross Winship of Cornell University has charge of the machine-shop.

Aurora, Minnesota, has a new high school with a well equipped manual training department. The equipment includes a number of power machines, two 10 h.p. motors, four motor-head wood-turning lathes, and several forges.

A number of Wisconsin schools have new departments of manual arts or domestic economy this year. Domestic science has been introduced at the Platteville Normal School by Miss Florence Ames of the University of Chicago. Portage has added both manual training and domestic science to the school system. At Black River Falls these subjects have been introduced into the high school. Durand has added agriculture and domestic science to the high school course.

Summit, Wisconsin, a prosperous farming community will have a new school building ready by the first of January, in which manual training will be well provided for. High, airy, basement rooms have been planned with the needs of this subject in view. Agriculture will also be studied. The building made of concrete, will cost about $15,000, and will have electric lighting and air-heating systems. Special attention is to be paid to beautifying the grounds next year. The progressive character of this rural school is due to the enthusiasm of certain residents of the community, notably Fred Pabst, formerly of Milwaukee.

SOUTHERN STATES.

Altho the South was slow to introduce manual training at first, now that a start has been made, progress seems rapid. New Orleans, Louisiana, will soon have a very complete system of manual training, if all plans are carried out. This fall, five teachers were employed to teach domestic science and art to the girls of the seventh and eighth grades. Shopwork for the boys of the eighth grade has been arranged under the direction of Mr. Crespo and an assistant. A girls' high school is in process of building which will have, when completed, a model household arts department. Equipment for industrial training will be a feature of the new boys' high school which is planned and will be begun shortly. The Isadore Newman Manual Training School in New Orleans is already well known.

FROM THE DURHAM, NORTH CAROLINA, PUBLIC SCHOOLS.

Covington, Kentucky, has had manual training in the public schools seven years, and has found the subject of such increasing value that the work was considerably extended this year. An entire building has been placed at the disposal of the manual training department of the high school. The high school pupils have been required formerly to take the subject one double period a week during the first high school year. This year a full four-year manual training course has been inaugurated, which requires a double period in manual training daily during the entire course. In the manual training building, rooms have so far been equipped for mechanical drawing, benchwork, machine-shop practice, and supervisor's office. Harry E. Roberts is the supervisor. It is very encouraging to see the subject thus recognized and given sufficient time in the school program to produce results.

Lafayette, Alabama, has a new department of manual training, domestic science and art under the supervision of Miss Jennie Rosser. The interest centers about the domestic science work, the reason for this being clear when an analysis of local conditions is made. In the South, we are informed, a negro can make from fifty cents to one dollar and fifty cents and sometimes more a day picking cotton, fifty cents being paid for every one hundred pounds of cotton picked. This being the case it is almost impossible to hire a cook. It is also impossible to procure white servants at any time. In the small towns such a thing as a white girl hiring out to cook being almost unknown. So Lafayette, lying among the snowy cotton-fields, is almost servantless in the picking season. This leaves many women ,not accustomed to doing their own work, helpless. The growing difficulty of the servant problem which must be met and solved in the small town as well as in the city, made the women of Lafayette rejoice that a domestic science course had been introduced into the schools, and many asked to be allowed to enrol in the cooking classes.

The equipment is in a well lighted, cemented basement, which is used for the kitchen. The town having no gas plant, a number of small oil stoves are used which seem to suit the purpose very well. Part of the basement will be used for clay modeling. Sewing, drawing and woodworking rooms have also been fitted up. Various forms of construction work are provided for the primary grades. Sewing and sloyd begin in the sixth grade.

The North Texas State Normal College, of Denton, has added equipment to the manual training department to the value of $1,100. The department was started a year ago with woodworking equipment for twenty students. The equipment now includes, in addition, twenty mechanical drawing benches, 12 h.p. engine and dynamo, planer, band-saw, universal saw, universal grinder, four wood lathes, and three hundred dollars' worth of reference and text-books on the subject. The machines are provided with individual motors. Clarence A. Triff is in charge of the department.

Dothan, Alabama, schools have new departments of domestic science and art, and industrial training in the grades and woodworking and mechanical

drawing in the high school. Miss Caroline Martner supervises domestic science and art, Misses Elizabeth Wolf and Margaret Ansley drawing and industrial arts.

WESTERN STATES.

Salt Lake City, Utah, has a new industrial building in connection with the high school. The building costs $100,000, is seventy feet by two-hundred twenty-five feet, and two stories high in the main part. The materials used in building were brick and cement. Fireproof construction was used, the doors being of steel and the stairways of iron and cement.

On the first floor are the wood-turning room and carpenter shop, pattern-making shop, machine-shop, foundry, blacksmith-shop, and paint-shop. On the second floor are two large drawing rooms, a study room which will seat over two hundred pupils, and an exhibit room. Ample wash-room facilities have been provided and plenty of drinking fountains. The equipment will cost approximately $25,000.

The high school has a new mechanic arts course consisting of English, algebra, a modern language, drawing, physics, geometry, clay modeling, chemistry, American history, plane trigonometry, and shopwork. The shopwork for the first year includes joinery, elementary cabinet work, some turning and finishing. The second year covers cabinet work, carving, some pattern-making, and finishing. In the third year of the course the work includes advanced pattern-making, forging, brazing, and soldering. Machine-shop practice is given during the fourth year.

The grades as well as the high school have a well developed manual training system. The work was started eight years ago with two centers. Now every building in the city in which there is a grammar grade is provided with a manual training shop. There is a corps of nine instructors for this subject in the grades. Domestic science was introduced two years ago in the elementary schools after a successful try-out at the high school. Seven special teachers have charge of the school kitchens in the thirteen schools so equipped. Sewing and housekeeping also are taught in this department. In the cooking classes emphasis is placed on the preparation of substantial meals and on marketing. In the high school the domestic economy course embodies "a study of those arts and processes which make for the care and comfort of the home."

Primary manual training is closely correlated with art work under the direction of the assistant in the art department.

The Siskiyou county high school at Yreka, in northern California, now has departments of domestic science, manual training and scientific agriculture, the last two having been added this year. While these courses are open to all they were especially designed for such students as find it necessary to reduce the time for high school work, and for those pupils who, altho fifteen years of age, have not secured eighth grade promotion certificates. The work in manual training includes woodworking, forging, and the study of the application of different kinds of power.

The night schools of Seattle are giving much attention to manual and household arts this winter. A four years' manual arts course has been arranged for the men, covering nearly every line of mechanical work. Pattern casting has been made possible by the installation of a 1,500 pound cupola, which is used

HAND-FORGED TOOLS BY STUDENTS IN SECOND YEAR, THROOP ACADEMY, PASADENA,, CALIFORNIA.

by the day pupils as well. General housework with cooking and all forms of sewing proves of much interest to the women students.

Tacoma, also, has added manual training to the list of night school subjects.

The high school curriculum at South Bend, Washington, has been extended to include manual training and the domestic arts. The boys who have elected this course are busy making the work-benches and drawing tables. They will also make the furniture for the girls' department.

Kennewick, Washington, will have a new $60,000 high school ready the first of the new year and will then have departments of manual training and domestic science.

Caldwell and Rigby, Idaho, have domestic science courses.

The manual training work is growing at Port Angelus, Washington. The department which was started three years ago, now includes bench, lathe and forge work. It was necessary this year to build an addition, sixteen by twenty

feet, to the thirty by fifty foot building used by the manual training classes. This addition was built entirely by the boys of the department. It will be used for a forge-room, and for work in molding and cement construction. H. G. Singer is the supervisor of this thriving work.

COLORADO.

New departments and improvements seem to be the order of the day in Colorado. Sterling has a new room for manual training equipped with twenty benches. Art, sewing, and manual training are all in charge of special teachers. At Cripple Creek the manual training is supervised by George T. Lloyd of the University of Iowa Engineering School. Miss Florence Riddle, a graduate of the State Agricultural College, has the supervision of the domestic science work. The Douglas County high school has courses planned in domestic science, agriculture, and horticulture for this year. Miss Augusta Durbin is teaching sewing and cooking at Durango.

At Fort Collins manual training, domestic science and domestic art are taught by new directors, J. O. Haug having the manual training, and Miss Fannie E. Wilson, of Duluth, Minnesota, having the girls' branches.

At Salida electrical cooking apparatus is used in the domestic science department.

At Trinidad manual training is provided for in the new $110,000 high school. Franklin Jones of Denver is in charge of the subject.

OF GENERAL INTEREST.

Dr. Carl Wilhelm von Sydow has recently been appointed director of the school at Nääs, Sweden. The English publication, *Educational Handwork,* in the October issue, gives a brief sketch of his life and work, from which we learn that Dr. Von Sydow is a young man, not yet thirty-three years of age, was born at Ryssby in Kronoberg, received his B. A. degree in 1901, and became a doctor of philosophy in 1909. He has been assistant at the historical museum and in the University library at Lund, and is also the registrar of the philosophical faculty. Since September, 1910, he has been lecturer in northern and comparative folk lore.

Dr. Von Sydow has had much teaching experience, having been active in the service of the People's high school at Lund, and having taught in the People's high school at Lunnevod in 1897 and 1898, at Katrineberg in 1902 and 1903, and at Ronneby in 1901, also from 1904 to 1908. In 1907 and 1908 he was principal of the Blekinge training college for the lower standards. He has given lectures for many of the lecture societies of South Sweden. The sagas and folklore of northern Europe are the subjects to which he has devoted much scientific research. On this theme he has published several essays. His lectures at Naas will treat of psychology.

Dr. Von Sydow is spoken of by men who have observed his career from the beginning, as a man of wide knowledge in many subjects, of great zeal and teaching ability and unsparing energy. He has made a practice in his high school work of establishing personal relations with his students.

The development of educational work in the island possessions of the United States shows what can be done by government control of schools. Manual arts work has usually been given a prominent place in the plans for educating these new possessions. Recent data from Porto Rico include manual training, domestic science and art, and agriculture in the list of subjects taught. Some form of manual instruction is provided in sixty-eight municipalities. Sewing has been taught this last year in fifty-six towns. Six localities had domestic science last year; this year eight more centers have been started. Regular manual training shops are in operation in connection with the schools of sixteen towns. In Rio Piedras, the boys of the manual training department built a two-room house for a carpenter shop and domestic science room, and also made the tables and other necessary furniture. Further extension of the work is delayed only for lack of sufficient appropriation.

An association of manual training teachers was organized in South Africa in January of last year. It is known as the "South African Association of Manual Training Teachers," and has a five fold purpose: first, "To advance the cause of manual instruction; second, To afford opportunity for discussion of educational and professional topics; third, To encourage friendly intercourse and to promote the interests of its members; fourth, To organize meetings for the reading of papers, lectures, and visits to places of interest; fifth, To arrange for the circulation among the members of literature bearing on educational topics and manual training in particular."

C. H. Young of Cape Colony was elected president of the association. News of the organization is furnished monthly by *Schoolcraft*, the official organ of the association. In this magazine are published the addresses given at the meetings of the association, so by this means teachers in the interior who are unable to attend the meetings get a degree of benefit from reading the addresses.

A 1911 number of *Schoolcraft* reports great progress in manual training work in all parts of South Africa, the greatest gains having been made in the larger cities. The course of manual training prescribed by the Education Department of Transvaal includes cardboard work, woodwork, and metalwork. The aim in teaching these subjects, as stated in the code, is "to give an intelligent mastery over tools, materials, and methods, and to develop a general practical knowledge which will be useful in any walk of life that the pupil may follow." The work for girls consists as usual of cooking and sewing.

Judging from reports and articles in the magazine the work in these colonies as been started in a safe and sound way and will doubtless continue to progress, following approved practice and giving due regard to the present trend of theory.

The Canadian Royal Commission, which was appointed to inquire into the subject of industrial and technical education in Canada, Europe, and the United States, has finished the European tour and is now engaged in investigating the schools of the eastern states. The Massachusetts schools are receiving special attention, Boston, Newton, Worcester, Springfield having already been visited. After a tour of Ohio schools, the commission will prepare its report to the Canadian government.

REVIEWS

ENGLISH BOOKS ON MANUAL TRAINING. II.

In our last issue we mentioned several representative English books on woodworking. In order to give an adequate impression of English publications on manual training, several books on other subjects should be added. Among the earlier books was *First Lessons in Hand and Eye Training,* by Gustav Kalb of Leipsic, translated by W. G. Field and published in 1893 by O. Newman & Co. This outlined work in building, stick-laying, ring-laying, weaving, folding, modeling, cardboard work, work with wood pulp, and woodwork with the knife, including chip-carving. Two years later the same company published the *Berlin Course of Easy Wood-Work,* also later translated by W. G. Field. This was a course for children but little above the kindergarten and consisted of construction work with twigs and thin boards. It was full of suggestions for construction and doubtless has exerted much inflence on later English courses. The same year, 1895, O. Newman & Co. brought out the third book of a series entitled *A Course of Practical Lessons on Hand and Eye Training,* by Alfred W. Bevis of Birmingham. This series was planned to be in four parts and these were intended for standards I to IV respectively. The first was on *Paper Folding,* the second on *Bricklaying and Parcel Tying,* and the third on *Wire-Work.*

About this same period there appeared a book of quite different type. This also was translated from the German by Mr. Field and published by O. Newman & Co. The book was *Manual Training Made Serviceable in the School,* by Dr. Woldemar Goetze of Leipsic. This showed how the processes of manual training in cardboard, wood and metal could be of service in constructing apparatus for teaching science. The effect of this book was far more marked in England than in America, and one of the outcomes would seem to be the admirable book by George H. Woollatt entitled *Laboratory Arts,* published by Longmans, Green & Co. This gives much attention to glass working.

In books on basketry England was ahead of America. *Cane Basket Work,* by Annie Firth, published in 1897 by L. Upcott Gill, has been the source of many an American course. Another book published about the same time, *Varied Occupations in String Work,* by Louisa Walker, has run thru several editions and is still a live book. This was published by the Macmillan Company. Another book by the same author and having the imprint of the same publishing house is entitled *Varied Occupations in Weaving.* The more recent popular work in raffia is represented by *Raffia Work* by C. W. Swannell, published by George Philip & Son.

Perhaps no more than two books on paper work need be mentioned. The best example of the kindergarten or geometric type that we have seen is *Carton Designing for Juniors* by J. H. Judd of Manchester, published by E. J. Arnold & Son. This book is especially strong in mathematical problems. It might almost be called "Arithmetic and Geometry for Little Hands and Heads." The other is *Paper Modelling* by C. W. Swannell, published by George Philip & Son. This book consists of classified problems in paper construction—barns, houses, furniture,

etc. The typical English cardboard work is well represented in *Cardboard Modeling* by Albert Sutcliffe of Cardiff, published by George Philip & Son in 1907. One of the earlier books in this same line was *Manual of Cardboard Modeling* by W. Heaton, published by O. Newman & Co.

Clay modeling, also, has received considerable attention in England—more than in America, and the work is technically stronger. Perhaps there is no more representative course than that found in the *Teacher's Hand-Book of Nelson's New Drawing Course* by J. Vaughn of Glasgow, published by Thomas Nelson & Sons. In fact the five books of this series ought to be in every reference library for drawing teachers, for they cover brush drawing, object drawing and design as well as modeling.

A recent book on *Clay Modelling in Manual Training* by F. W. Farrington, published by Blackie & Son, contains many good suggestions. His method of working from profile drawings is especially to be commended, but his selection of forms for study is sometimes most faulty. At least the forms selected are not "plastic" in quality. —C. A. BENNETT.

Engineering Drawing. By Thomas E. French. McGraw-Hill Book Company, 1911. 6x9¼ in.; pp. 289; 452 illustrations. Price $2.00.

The best of all recent publications on constructive drawing. Described by the author as a manual for students and draftsmen, it takes the best ideas from commercial practice and presents them in an unusually clear form for the student.

The author treats drawing as a language, the written language of the engineer, and shows the use of the language in the expression of the ideas of the machinist, architect, civil engineer, structural engineer and reproductive draftsman. Beginning with a short introductory chapter on the meaning and the field of engineering drawing, the book treats successively of the following: The selection of instruments, the use of instruments, applied geometry, lettering, orthographic projection, developed surfaces and intersections, pictorial representation, working drawings, technical sketching, the elements of architectural drawing, map and topographical drawing, duplication, and drawing for reproduction, notes on commercial practice, ending with a bibliography of allied subjects in which the student, draftsman and engineer can find listed many of the best books relating to their work.

The book does not present an outlined course of study but gives exercises illustrating the different principles presented in the text. It is not a theoretical treatise but a practical exposition of a living language. The chapters dealing with architectural and topographical drawing, and drawing for reproduction are well treated and show the adaptability of the language to the ideas expressed. The chapter on working drawings alone places the book in a class by itself, although the treatment of so important a subject as structural drawing in the two pages of text and two page illustrations allotted to it, is hardly equal to the thoroughness shown in the rest of the book. The often neglected subject of sketching is well treated and given its just place in the chapter on technical sketching. The book abounds in illustrations all of a high standard of technique. It is to be regretted however that some of the drawings are reduced too much.

The book establishes a new standard and will help in building up and binding together many scattering ideas on this subject. It is a book of unusual merit. —L. L. SIMPSON.

School Drawing, A Real Correlation. By Fred H. Daniels. Milton Bradley Co. 8½x6 in.; pp. 156. Price $1.20.

Teachers of construction will be enthusiastic over this book, while teachers of drawing will find in it much food for thought. It presents by means of reproductions of photographs, diagrams and brief descriptive text, the "scene-painting" or "poster work" now familiar to every primary teacher. This book shows how work of this character can be carried beyond primary grades if time and conditions make it advisable. The problems combine construction, drawing, and sand-table work illustrative of geography, history, and language; hence the title "A Real Correlation." In the introduction, which we wish had been more explanatory, the author states that "The principles of perspecive, such as the idea that distance decreases the apparent size of objects, are easily and thoroly taught in this construction work." Herein lies its interest for the drawing supervisor. Crude tho it is, and defy all rules of proportion tho it may, this work is intensely interesting to children, and, Mr. Daniels asserts, aids much in teaching basic principles. How to fit such work into that larger plan which has for its end and aim the development of good taste and appreciation of the beautiful, is a problem worthy of much study from all supervisors. —V. E. WITHEY.

The Second Boys' Book of Model Aeroplanes. By Francis A. Collins. The Century Company, 1911. 5 x 8. pp. 262. Price $1.20, net.

The last year has added so much to scientific knowledge of aeroplane construction that this new book seems necessary. This second book will prove even more fascinating to the boys than did the author's first book on the same topic. The present volume gives all the up-to-date matter on the construction of models, and in addition, descriptions of tournaments, curiosities of the air, rules for conducting contests and arranging clubs, and news of recent model builders, their records and flights. A number of clear diagrams and working drawings are added to the numerous fine half-tone illustrations. This supplies a need felt in the earlier book. The author explains, however, why more dimensions are not given, the fact being that air conditions in the different localities must govern the dimensions and strengh of parts in the models. Emphasis is laid on monoplane construction as this plane is now preferred to the bi-plane. The work explained in this book is far from mere toy-making, inasmuch as all airship builders must begin with small models. So a boy may well feel in making these models that he is taking a part in the experimentation of the bird men. Manual training teachers will find this book of use in stimulating interest in homework. —V. E. WITHEY.

Principles of Machine Work. By Robert H. Smith, Massachusetts Institute of Technology. Published by Industrial Education Book Co., Boston, 1910.; 5x8 in.; pp. 388; 434 illustrations. Price $3.00.

The book gives a very clear and well illustrated description of the engine

lathe and how it is operated. The first chapter describes and shows clearly by many sketches the parts of the lathe and their use.

Following the description of the lathe the author discusses the theory of the cutting tool and how to set it in the machine with respect to the work, so as to get the best results. Many different sketches show clearly how to grind a tool and what rake, clearance and cutting angle it should have in order that it be suited to the metal and cut it is to take.

The various fits, as running, sliding, driving, etc., used in machine construction, with tables of allowances, are fully explained. In the same clear style the author discusses tapers in machine construction, the different methods of taper turning and rules calculating the amount the tail-stock is to be set over.

The art of screw-cutting in the engine lathe is probably one of the most difficult, and yet one of the most interesting operations for the beginner. The various steps, kinds of threads, and methods for calculating what gears to use for this work is fully explained and illustrated.

The chuck and face-plate are two lathe attachments on which much work is done. The use of these attachments, how to true up work on them and the various methods of clamping work to the plate are fully described. In connection with these naturally comes, in many cases, the use of the reamer, and the author gives the method of making and using the different kinds.

The standard solid mandrel, and other different kinds are described and illustrated. To make a standard lathe mandrel is a regular exercise given in the book, and involves squaring, turning, milling, hardening, tempering and cylindrical grinding. These operations are very clearly described and directions given under "Schedule of Operations, Machines and Tools."

Hand turning is fully explained by giving directions for making a machine handle. Tools for brass turning, finishing, spring-winding and the principal points in machining bronze, copper, aluminum, raw hide, etc., are clearly explained and illustrated.

Chapter XIV gives a clear and well illustrated description of the universal grinder, grinding wheels, how to mount and true them, care of the machine and work and problems in cylindrical grinding. The vertical and multiple spindle drilling machines, drilling jigs, and different kinds of drills and how to grind them are clearly illustrated and described.

A portion of the book is devoted to bolts, nuts, the various kinds of screws and how to make them. The method is also given of calculating the diameter of blanks to mill square and hexagonal. Chapter XIX closes the book and is made up largely of tables, diagrams and other data useful in the machine shop. The complete indexing, the 434 clear illustrations, and the method of giving directions how to make the several typical exercises, or problems, serve to make the book one of great value to the student in the technical, trade, or manual training school, and also to the apprentice in the shop.

—Paul W. Covert, Manual Training High School, Indianapolis, Ind.

Housekeeping and Household Artss Bulletin No. 35, *Manila Bureau of Education.* By Alice M. Fuller. Manila Bureau of Printing. 6 x 9. pp. 179.

This teacher's manual is written by a teacher of domestic economy in the Phillipine Islands, a teacher who knows the conditions and has planned her book

with reference to them. The subject matter covers sewing, cooking, care of the house, care of the sick, hygiene and ethics, and is divided according to grades, each grade having its proper share of each topic. No iron-clad courses of study are laid down but suggestions are given by which the best is to be made of local materials and conditions of living. Teachers are repeatedly cautioned against giving instruction beyond the comprehension of the pupils. Sympathy, tact, and cooperation with native homes are frequently urged. The talks on hygiene and ethics are very direct and simple. The fact that Phillipine women hold a much higher place in home and community than other oriental women is pointed out to show what a vast influence well assimilated lessons on such subjects may have. The book might well form a model for American text-writers on the subject, and would prove very suggestive to domestic economy teachers in this country, where in many places too much emphasis has been placed on the following of courses and sequences and too little on the fitting of local conditions and real service to the community.

The Teachers' Practical Philosophy. By George Trumbull Ladd. The Funk & Wagnalls Company. 5 x 8. pp. 339. Price $1.25, net; by mail, $1.36.

This book, by a former professor of philosophy at Yale University, is a collection of lectures covering the different phases of the following topics: The function of the teacher, the chief ideals of the teacher, the equipment of the teacher, and the teacher's relation to society and the state. It presents no new or startling theories but is simply a well-presented reiteration of the underlying truths of the teacher's professional practice. All teachers, manual arts teachers included, owe it to themselves and to society to read now and then a book of this type which will remind them of the larger aims and broader relations of their work.

Woodworking for Amateur Craftsmen. By Ira S. Griffith. The Popular Mechanics Company, Chicago, 1911. 5 x 7. pp. 121. Price 50 cents.

This latest of the series of Popular Mechanics Handbooks is a very well-gotten-up little book, which deals with the elements of woodworking, beginning with the buying of lumber, and going thru all of the steps necessary to the squaring up of stock. The nature, use and sharpening of the usual tools are explained, and directions are given for making several pieces of furniture. The simplicity, directness, and clearness of style, as well as the quality of the illustrations are to be commended as suited to the purpose of the book, which is designed for beginners.

Circular of the Latshaw School, 3410 Spring Garden Street, Philadelphia. The Latshaw School for the training and development of difficult and defective children, has issued a circular that contains interesting reading for students of education. The special object of the school is to "find the hidden causes which balk the child's progress, to correct the orientation, and to develop acumen." Numerous instances are given of children who had been regarded as hopelessly imbecile or idiotic, who had yielded to the special methods and treatment of the school and had gained a considerable measure of useful individuality, balance, and accountability, if not what could be called complete recovery.

Text-Book on Domestic Art. By Carrie Crane Ingalls. Cunningham, Curtis & Welch, San Francisco. 5 x 7. pp. 250; 60 illustrations. Price $1.50.

The subject matter of this book is divided into three parts. Part one consists of rules for sewing and instruction in elemenary work by means of samplers and a few models. In part two is a comprehensive discussion of drafting and garment making, clearly diagrammed. Part three discusses simple embroidery and lace stitches. The illustrations thruout the book are good and the text is clearly written and well arranged.

DURHAM, NORTH CAROLINA, PUBLIC SCHOOL.

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WHAT CAN THE HIGH SCHOOLS DO BETTER TO HELP THE INDUSTRIES?

Fred D. Crawshaw.

THE teachers of manual arts should be vitally interested in the subject of industrial education. School administrative officers are perplexed to know what can be done in the public schools better to prepare boys and girls for the occupations of life. They have responded to the demand for manual training, domestic economy, commercial studies, and agriculture, but they are told that these subjects as they are now generally taught do not emphasize sufficiently the vocations for which they might prepare. The question which must now be answered is this: Shall these so-called vocational subjects be taught to all who elect them for vocational ends alone, or shall new courses be organized to meet the needs of those who are to go into the occupations of life at the earliest possible date.

Much has been done within the past two years to train more effectively for industrial work. The public school has reorganized its courses. The factory has cooperated with the public school. New schools have been established. Vocational education has been the object of each of these and other innovations. In some of these the pupils of the upper grades have been the ones for whom the changed or the new organization was made; in others the high school boy or girl was the subject for consideration.

This article deals with the high school boy in the training he may get in the high school manual arts department to give him either the cultural values which have been accredited to manual training or the vocational values which it is believed the public high school manual arts should have. If our present educational machinery can be operated to do the things which vocational education demands and at the same time continue to serve the purpose for which it was first installed, viz., to give general educational values, there can be little argument against this larger use of present equipment. It would seem, too, that by thus determining the possible larger scope of present educational plants there may be created a public opinion which will prevent unnecessary duplications in the erection of new school buildings for industrial education and in their equipment.

No class of school teachers has a broader field in which to work than those who teach the manual arts, and none has more vital problems to solve. In the old academic studies conditions have become somewhat settled and methods at least partially fixed. Not so with the manual arts. The problems presented in the teaching of these subjects are more numerous and more varied than they ever were. However, they are not as difficult perhaps as many which have already been solved by the pioneers in those lines of school work which are generally classed under the head of motor training. Thanks to such men as President Runkle, Dr. Belfield, Dean Woodward, and President Harvey, the work of the missionary in manual training is finished for the most part. The younger generation, of which we are a part, are not so much concerned with the question of the introduction of manual training as with the question of what kind of manual training shall be maintained.

Manual training as it is taught at present is subject to criticism because of its character. This condition, of course, is the result, in part at least, of the employment of individuals as teachers who are unprepared for the work in hand. This is not the principal reason, however, for chaotic conditions. Manual training at present is in a formative period of development. It is transitional both as regards subject matter and teaching method. No one can say, with any reasonable degree of certainty, just what should constitute a course of study in any manual training medium. To a greater or less degree we are *all* experimenting, and none of us who is mindful of the rapidly changing conditions is failing to be a keen observer of different plans which are being tried out in different communities by those who are courageous enough to take a step forward, even tho it be in the dark.

MANY DIVERSE POINTS OF VIEW.

The ideas advanced by Dean Russell of Teachers College, Columbia University, on the subject of industrial education; the cooperative plan of education, which places a boy in a factory one week and in school the next; the theory that trade education should be introduced as early as the sixth or seventh grade in the school process; the plan to make all projects in manual training courses meet the social needs and intensify the play of students: all these and other experiments which are now being tried as a means of satisfying the demand for a change in manual training are commanding our most careful attention. It is because there *is* such a divergence of opinion regarding the content of manual training that it is subject to criticism regarding its character. Likewise it is one reason why the rapid introduction of manual training is fraught with danger. And yet, one would not have conditions change because it is only by experiment and by constantly keeping in touch with public opinion that we may hope to progress and make the most of our opportunities.

These cannot be fully realized, perhaps, without a knowledge of the development of the manual arts in this country. Space will not permit of an extended review. Suffice to say that some twenty-five or thirty years ago high school education was challenged because it did not prepare for specific occupations. Manual arts departments in high schools were started and manual training high schools were built such as the St. Louis Manual Training High School and the Chicago Manual Training High School to train boys for immediate service in the mechanic arts upon graduation from high school. Then, as now, there was a feeling on the part of the general public that the public school was not doing its full duty in the education of the youth of the land. Boys went out from the high schools without any definite preparation for particular service. History, therefore, has repeated itself and after some twenty-five or thirty years of trial we are told that manual training is not fulfilling its mission. What is this mission? The sometimes so-called selfish commercial interests say:—To train boys (and girls), for work in the shops and factories. The educator has said:—To give boys (and girls), a familiarity with tool processes and the fundamentals of industrial methods; at all times making his training, running along these lines, compare favorably from an educational standpoint, with that in other studies in the curriculum.

My contention is that both of these views have merit and that each should receive due attention. If it is true that manual training in the high school started for the purpose of fitting young people for direct community service and it has not done it, and if the influence of the educator has been stronger than that of the man who employs the one educated, and who probably pays the largest sums for his education, (as is, in all probability, the case), there is little doubt that the trend of manual training has not been toward industry. Perhaps it has even been away from it. We, of course, recognize the fact that only a very small percentage of those who enter the high school continue their education in school after they complete their high school course. What then is the natural conclusion to be reached regarding the education of the high school boy and girl? It would seem there can be but one answer, viz; give each individual the broadest possible education in the high school to fit him for the largest possible service in the community in which he is to live. To do this we must work on the theory that few if any high school boys, in at least the early high school period, are capable of determining what their calling in life will be. Assuming this to be true the logical thing to do in outlining high school courses of study is to place in every course as many of the liberal or non-vocational studies as possible together with those which may be classed as vocational. This plan operates to afford for each individual student the means of selecting, before he reaches his senior high school year, his chosen *profession* or *vocation.* If the selection is that of a profession then the student plans to continue in school after he leaves the high school. If the selection, on the other hand, is that of a vocation, the student will plan, probably, to take up his life work immediately upon the completion of his high school course. In either case, the course of study for the first two or three years is such that whatever his selection may be he will be permitted to continue work without serious loss of time.

In general, high schools now provide for the boy who will continue in college, where he may elect a course leading to one of the professions. It is not generally true, however, that the average high school provides *so well* for the boy who selects a vocation, and who by the way is a member of by far the larger of the two groups. The reason for this is that high schools are not equipped to give intensified instruction in vocational subjects. The solution of the difficulty which seems natural and practical is this: *So organize the high school that it will provide equally well for all classes of students.* Immediately when you do this

one of two things happens. Either the high school becomes an institution which provides for specialization along a number of lines, or else it cooperates with industrial centers in the community to add substantially to its facilities those which the industries provide.

I shall consider in some detail each of these plans, and in the order given.

TECHNICAL WORK IN EVERY HIGH SCHOOL.

The exercise of the *fundamental* types of activity results in social and economic progress. From an industrial point of view the school of the past has not fitted the child for the practical things of life because the fundamental industrial activities have not been given due consideration in school processes. It has dealt with the democratizing influences, but only with that portion of them which affected stages of development up to but not including the present one of industrialism. And yet we know that the work which demands the use of the hands in skilled labor is the means of livelihood for a large proportion of the adult population. Such being the case, the school has an obligation to the community which it must pay by giving its pupils a knowledge of a functioning sort. If, then, the shop and drawing room, the kitchen and laboratory within the school will serve to furnish children both *information* and *practice* which later on will give them a community standing, these instruments point the way toward both social and economic ends and possibly toward one solution of the problem of better helping the industries by utilizing already established means. Ideals in life must be established in the manual arts which emphasize the mechanical and industrial standards of the workaday world as well as school standards. We cannot fully appreciate the viewpoint of the worker in any walk in life until we ourselves are put in his place.

This statement may seem to argue for the establishment of special industrial schools or for the use of factory facilities for the pupil while he is attending high school. It may be granted that either of these things may be done and possibly to advantage to the boys concerned. However, where industrial training has been provided by either of these means it has been found that there are some decided disadvantages accruing to the pupil. It remains to be seen, therefore, whether or not within the high school conditions may not obtain to provide what has been lacking and to retain as well all that has proven worth while.

To give industrial training in manual arts departments except in the large general high schools or those designated as technical high

schools will require at least two additions to present facilities. First, more time must be allowed for manual arts subjects. It is entirely impossible to acquire a technique adequate for the industrial worker unless much more time is given to shop processes than is at present allotted to manual training. It is possible, however, so to arrange a program that this may be done. It is now being done where boys are sent out to manufactories for their shopwork. Why not do it for the shopwork carried on within the school? Second, larger and more carefully selected equipments will have to be provided. This, also, can be done if it is deemed wise to conduct all shopwork within the school. It is not so much a question of expense as one of greatest needs and best results which will decide whether or not the school shop shall continue to be the place for training boys in shop processes. Some one may say that a new kind of teacher is required for industrial shop instruction. Perhaps so, but he may be secured for the school shop as well as for the factory shop. In this connection, too, the suggestion is made that in our best manual arts shops today instruction is being given which is *not much* if *at all* different from that which will be and is now given to those boys who are working under the best of the so-called school-factory shop plans. At any rate the kind of instruction in one case need not be different from that in another. In a very large measure it is merely a question of time and equipment.

It has been suggested that every course of study in the high school from the very beginning should include both vocational and non-vocational subjects. Specializations in the early part of one's high school work cannot be advocated. It is a general feeling among educators that it is the duty of the school to lay foundations which are broad and general at this point in the high school process. However, with a clear conscience, one can advocate an arrangement of a school curriculum so that as early as the *sixth* grade in the grammar school the motor element in school work shall have a strong industrial significance. Indeed if this is not done we shall continue to have the great gulf which now exists in the grammar grades and again between the elementary school and the high school and in which so many lose themselves forever to school work. It is estimated that at least 70 per cent. of all those who enter the public schools fail to reach the high school. We must *first* provide for these by making our manual training savor of life's problems in as real a way as possible before we can hope to accomodate ourselves to the pressing demands made upon the high school to make it serve the greatest number.

As the child reaches the age when the state relinquishes its hold upon him as a school subject, he realizes somewhat his possibilities as a wage earner. He sees everywhere about him men and women whose daily life is spent in an activity of which he knows little or nothing. He begins to feel that the information which he is getting from books has almost no relation to the work which he apprehends will be his when he leaves school. As a result, he longs to join the great army of his fellows who early leave school to go to work. It is at this point—in the grammar grades—that manual training should offer a real point of contact with the workaday world. It should begin to deal with materials of industrial significance, and in a way which will train the youth in processes which the industrial worker follows in the factory and business house. The intermediate school advocated by some may be a means to this end.

It must be remembered that the average boy who leaves school at the age of 14 to 16 will find only such employment as that which may bind him forever to an unproductive service. On the other hand, his retention in school for three or four years will mean a preparation for lifework, especially so if during this period he is learning things which will give him the ability to take up work offering opportunities for growth when he leaves school. School work which will do this for a boy has an industrial value. Manual training should play no small part in making it self-evident to boys that the school is the *best* place to acquire knowledge and skill for their future activities. It must promote efficiency both in intellectual and industrial attainments.

Now, industrial education, so called, and manual training must be *essentially* the same. Each must have for its purpose the acquisition of a fund of knowledge capable of making its possessor an efficient future worker in the industrial world. It must acquaint the individual with the tools and materials used in industrial processes. It must do more than this—it must give him a broad outlook upon industrial conditions; it must so organize his individual forces that he may have, as a result of his knowledge and skill, a mental, moral and physical control of himself; it must make him, in a word, a useful, helpful citizen.

To consider specifically now the things which the high school may do to provide for the industries. Let us not suppose that the high school has not always done much in this direction. It has. However, it may do more. I have hinted at a means of increased efficiency in the direction of industrial training to take place *within the school.* What

does this mean? This: that the high school should be organized upon the plan of a university organization where provision will be made for a great variety of occupations.

Dean Eugene Davenport, of the University of Illinois, has become recognized as a strong ally of those who are tremendously interested in the possibilities of the high school. He is an advocate of universal education. As his plan is in harmony with my humble views on the subject in question, I quote him as follows:

> If we will honestly take into our high schools as we have taken into our universities all the major activities of our modern life, splitting no hairs as between the industrial and the professional, for no man can define the difference, so imperceptibly do they shade the one into the other—if we will take them all into the high school as we have already taken them into the universitis, and carry them along together, the vocational and the non-vocational, side by side, day after day, from first to last, so the boy is never free from either, then will our educational necessities be met and we shall have gained a goodly number of substantial achievements.
>
> In thus amalgamating the vocational and non-vocational, I would like to say a word for what might be called the parallel system as distinct from the stratified. That is, I would have a boy, from his first day in the high school to his last, have to do with both the vocational and the non-vocational. I would have him every day take stock of things vocational in terms of world values. I would have him devote a full fourth of his time to what will bring him earning power, to be used for that purpose if he needs it and to give him an independent spirit if he does not need it. Every man is a better man if he feels the power to earn his way, whether he needs to do it or not.
>
> The best results will always follow when as many subjects as possible and as many vocations as may be are taught together in the same school, under the same management and to the same body of men.

Again I refer to the university and large colleges, for it is in them that I find the illustration I want to express my views. These institutions provide an equipment for a diversity of interests, but it is mainained for the few who are using it for specialization. Suppose now we consider corresponding facilities for the people's college—the public high school—where many are cared for and where one gets a general rather than a specialized education.

Let us organize our high schools then on much the same basis as they are at present organized except that instead of considering the four years as a preparation for some further work we make the preparatory period run thru the first three years only. During these years in the manual training and drawing departments we will give the several subjects as broad an educational value as possible but at the same time have them so thoroly industrialized that they will represent

wherever possible *precisely* the existing industrial conditions. By so doing pupils will become acquainted with actual conditions and appreciate in a measure what their future work will be should they select as their chosen field any one represented by the school courses.

Now, in the fourth year, we will in a sense segregate those who will continue school work in colleges from those who will immediately enter the industries upon their completion of the high school course. To this section in the senior year we will give a special course in the vocation to be followed in life. If it is pattern-making, allow the boy to major, as we say in the university, in this subject. If the textile industry is his selection, let us be sure that the high school offers facilities in this field comparable with those of the industry. But in addition to the special line of work chosen we will give the pupil the advantage of the English, mathematics, history, and science which will help him *most* in his future competition with others who are also textile industry workers but who have not had the advantage of the liberalizing influences of the school.

I desire to emphasize one feature of this plan which I believe to be imperative, viz: Put the special work followed by the pupil in his senior year under the supervision of the *leaders in the industry represented.* I doubt if we shall ever get industrial conditions to obtain in the school if we allow school men to organize the work of industrial courses, unless they have had the special industrial training needed. On the other hand, I maintain that the executive heads in the school system must remain in general control. Germany gives us our best illustration of what can be done in this direction—one of cooperation: The sanest kind of cooperation between the school and the industrial leaders.

I anticipate an objection (many in fact), which may be offered to the plan proposed. One at least is this: The boy will not be ready when he reaches the senior high school year to make a selection of his future life activity. Perhaps this is so. However, if there is any particular place in the school process where pupils should be able to discover themselves, it should be the high school. As a rule, an individual is old enough upon leaving the high school to know what his real desire is concerning a future occupation. He has determined definitely on many occasions perhaps just what his future must be, as did Richard in Dickens' Bleakhouse, only to change his mind within a fortnight. Notwithstanding all this, I still maintain that the high school work should be so general in its scope and yet so definite in its character as

regards any particular course, that the average boy finds himself before he finishes his junior high school year, if possible. His senior high school year should be used particularly to fit him either for active life-work or college work. Professor C. A. Bennett, of Bradley Polytechnic Institute, Peoria, Illinois, in discussing the advantages of the general high school, where the proper emphasis is given to the work of any department, over those of special high schools, says:

> The question then arises: Is it not possible to organize a high school which shall bring together the opportunities of all these special schools in a single organic whole? When this question shall have been answered in the affirmative, and a satisfactory plan for such a school outlined, then we shall see more clearly the form and framework of a superior type of school. Moreover, this school will be as well suited to the needs of the small city as of the large. Then the high school in the small city can be, as formerly, the same in kind, though not in degree, as the school in the largest city.

Few will say that for the large city the high school organization proposed in the preceding paragraphs is impossible. Many will say after due consideration that it is both possible and feasible. But for the small city or town there may be some doubt expressed even tho in such communities few, perhaps only one or two, industries will exist and will therefore demand specialized work in the high school. For the smaller high schools then the following plans are proposed.

THE HIGH SCHOOL IN THE SMALL CITY.

First. Permit the high school to cooperate with the manufactories and industrial establishments of the community, the school to continue to be the adjudicator of the academic work and the factory to supply the industrial conditions and adjust itself somewhat to the conditions of those of school age. This plan is already in operation in Cincinnati. A somewhat similar plan is being tried in the east at Fitchburg and Beverly, Massachusetts, and other cities. Nearer home, we have at Freeport and Moline, Illinois, school and factory cooperation which promises to be successful. Time alone can give us an opportunity of deciding whether those in charge are on the right road.

Second. Organize within the small high school manual training and industrial work which shall be guided by some large center; a normal school, a large high school, or university. Let the director in this center cooperate both with the local school board and with the industries of the community in determining the kind of work to be introduced. Select some individual who will be competent to teach the

course outlined. Give him a circuit in which he will have a sufficient number of schools to occupy his time. It seems to me that this plan should be much more feasible than the one which necessitates the manual arts work of the pupil to be done in a factory because it provides for a more general supervision and a control by several interests instead of one; also, because the instructor would, in all probability, be selected partially because of his knowledge of school conditions whereas the factory instruction is likely to be given by a factory operative or an individual who will be unable to see the large problem involved, and coordinate the work of the shop with that of the school. This plan, the second of the last two offered, is now operative in some of the smaller high schools in Wisconsin and while it is being tried this year for the first time it promises to meet with success and the general approval of all concerned.

I have just one more suggestion to make in conclusion, viz:

Whatever means we take to make our high school manual training more nearly prepare for the industries let us be sure that in season and out of season and all the time we introduce into our work design which shall eventually make our industrial products compare favorably from an artistic point of view with those of foreign producers. What a great humiliation it is that we, the American people,—leaders in so many lines—are so deficient in industrial esthetics. What we need is an appreciation in design. The public school cannot train designers, except, possibly, in a high school senior year vocational course; but it can, by recognizing good design in all its work, raise the standard of appreciation for good design. What a wonderful change can be made in this direction in the next decade if we manual arts teachers in our small way will lay emphasis upon good design in both drawing and shopwork. It is an open question if there is not even a greater need for study of design on the part of manual arts teachers than for a more intimate knowledge on their part of industrial processes.

Originality is not claimed for any of the theories which have been set forth in this paper. I claim merely a clearer understanding of the needs of our present situation and a clearer insight into some of the plans which have been advocated by leaders in our chosen professional work.

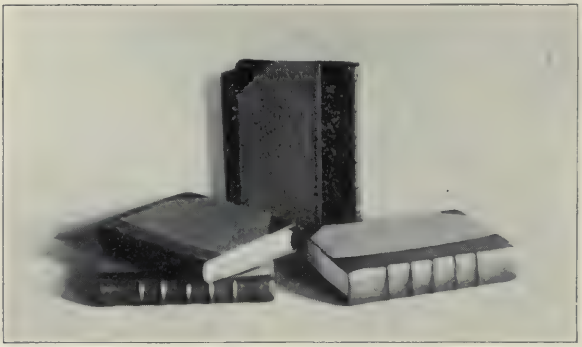
In summarizing, these suggestions may be made to make the high school manual arts better prepare for the industries, and, in fact, for general service and efficiency.

First:—That an intermediate or prevocational school be provided for those in the sixth, seventh and eighth grades who now take advantage of their first opportunity to leave school—the time when the state ceases to compel them to attend school.

Second:—That there be organized one general high school in a community instead of two or three special high schools. That in this school during the first three years all pupils be given at least a minimum amount of manual work which is both good manual training and good industrial work. Also that provision be made for specialization along industrial lines in the fourth year; time and, if need be, better instruction, to be given for this specialized work.

Third:—That in case the *general* high school organization is not feasible or possible, to provide for specialization in industrial work by a school-factory cooperation or by the circuit instructional method wherein supervision will be obtained from recognized authorities representing both the school and industrial interests, and provision for maintenance will be made thru an educational extension department.

Fourth:—That in all drawing and shopwork a large amount of sane design should be an ever present necessity.



BOOKS BOUND IN SUMMER SCHOOL BRADLEY INSTITUTE.

ROOMS IN PAPER.[1]
PROBLEMS IN CONSTRUCTION AND DESIGN.
II.

NAMA A. LATHE AND ESTHER SZOLD.

OUR pupils are enthusiastic. They have furnished their room as an indefinite but no less enticing air-castle. They are anxious to be doing. Whatever room may be chosen, we begin by making the chair, not only because the chair in its elementary development is one of the simplest pieces of furniture and because it is the one article of furniture found in every room in the house, but also because it is the piece which the pupil knows best. He has seen many kinds of furniture, but he is acquainted with but few. He has been intimately associated with chairs from early infancy. He began to discover the qualities of a chair when he found that he could climb up by its rungs when tired of creeping, that he could push it as he first began to walk. The chair continued to be his best friend in furniture, it made an admirable horse, or a carriage, an engine, or part of a train of cars, an Indian tent, a fort, a castle, or even a perfect toboggan slide (when no vigilant housewife was near), besides assuming its natural and normal form and function at times. He has already pushed, pulled, handled, carried, and overturned more chairs than he ever will beds, desks, tables, or pianos.

PRESENTATION.

In this article we have given, in a minute and definite manner the directions for making the chair, so that a pupil of the fifth grade or above could read and follow the directions for himself. In the schoolroom where the teacher may direct the thought, broader experiences should be gained by the pupils. With a paper model but lightly pasted, with a simple chair and a yardstick, the teacher is equipped. The pupils have the paper, good rulers divided to sixteenths of an inch, triangles, and sharp HH pencils on their desks. If drawing-boards with T-square and triangles can be provided they will simplify the work exceedingly. The directions, however, are given for the simplest equipment. The pupils measure the real chair, height of back; and height, width, and

depth of seat. Using the scale, one-eighth of each measurement is found and used as a basis for the model. Unfold the paper chair to make clear the relation of the pattern and object. The plan of the chair should then be laid out as in Figure 7.

In the general directions are given detailed instructions for reading drawings, measuring, ruling, etc., because we have found that people who have not made a special study of such things, even tho they are teachers, often need definite help in these matters. The directions have been prepared so that it would be well if each pupil could have a copy for reference.

DESIGN.

Altho the dictation and drawings for the chair and drawings for other pieces of furniture are here given in exact detail; whenever the work can be supervised by a teacher many of the details should be planned by the class. Here is opportunity for original design under very definite limitations, and for discussion and comparison of ancient and modern, local and foreign designs for similar articles.

The fundamental spaces in any piece of furniture are naturally limited by their necessary relation to the human figure. The limitations and possibilities of wood construction are also determining factors in the design, but within all these limitations many variations of spacing can be made. For example, the limitations in design for chair backs, all of which fifth grade children can understand, may be outlined thus: A chair back must be strong but not too heavy. Wood construction requires fairly simple lines and some consideration must be given to ease of dusting, for a chair in daily use. The height of the back and appropriate lines will be determined by the use and associations of the chair. The kitchen chair will be very simple, but the spaces and rails should be beautiful in their relation, the dining-room chair may be somewhat more elaborate but should still be easily cleaned. The chair for the dressing table in the bed-room will have a low back without projections to catch the hair, a chair with a very high back suggests formal use.

To secure the necessary strength for the chair back we use upper and lower rails between the supports, or panelings which run from the upper rail to the seat. The greater the open space the lighter the chair. The teacher should sketch upon the blackboard several spacings of the character of chair back desired or have pictures or cuttings showing several such variations. The pupils then cut strips of paper the width

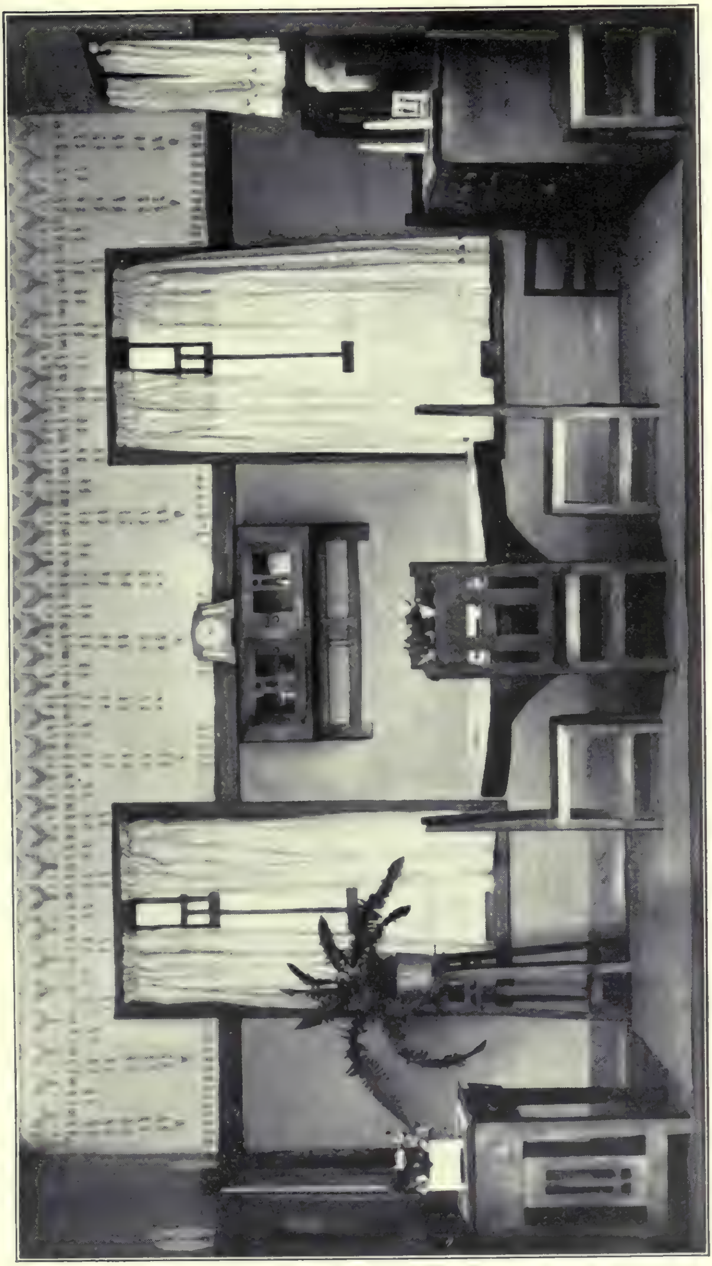


FIG. 20. ROOMS IN PAPER—DINING ROOM.

of the chair they are making and mark in the width of the side rails. Note the heights above or below which the chair back would be undesirable and within these spaces sketch different designs of rails and panelings, filling in with pencil tone all parts which represent wood. Fold on the vertical axis and cut out the spaces as shown in the better half. For quick appreciation of the relation of space to substance make the design of material and space. Criticise the designs by choosing those which have satisfactory spacings.

Fig. 12 shows some of the possibilities of chair back designs made in this way. Many of these are from designs made by fifth grade pupils, the rest were made by adult students. Several of the simpler ones might be used as the basis for a series of variations.

Designs may be planned in this manner for any place where paneling or open spaces within an enclosure are desired. The end of the library table, end of the piano bench, the back of the davenport, the side of the fern stand, the profile of the support for a projecting shelf as in the buffet, are some of the problems that give an opportunity for this work. The arrangement of the doors and drawers on the front of a dresser or buffet may be planned by drawing.

COMPLETION OF FURNITURE.

We select from the designs made by the pupils one which we will use for the chairs of our room. The design should be measured carefully and drawn to measurement upon the plan of the chair, or, when the spacing is too subtle for such treatment, the design itself may be used for a measure.

For the glueing we have found glue in tubes with a pin-stopper, the most convenient and economical form to use in the schoolroom. We have used Dennison's.

The furniture was made of Buckskin manila paper of the heaviest weight obtainable. The texture of the surface is smooth, and the color light enough so that fine pencil lines may be seen readily. It is sufficiently tough and fine-grained to fold smoothly when scored. In our work we have stained the furniture after it was made, which seems a very logical thing to do with furniture. It certainly looks well, and a multitude of finger marks are covered. If paper of satisfactory color, texture, and weight could be procured one might make the furniture without staining. The first piece should be stained before the second one is glued, for the stain will not penetrate thru

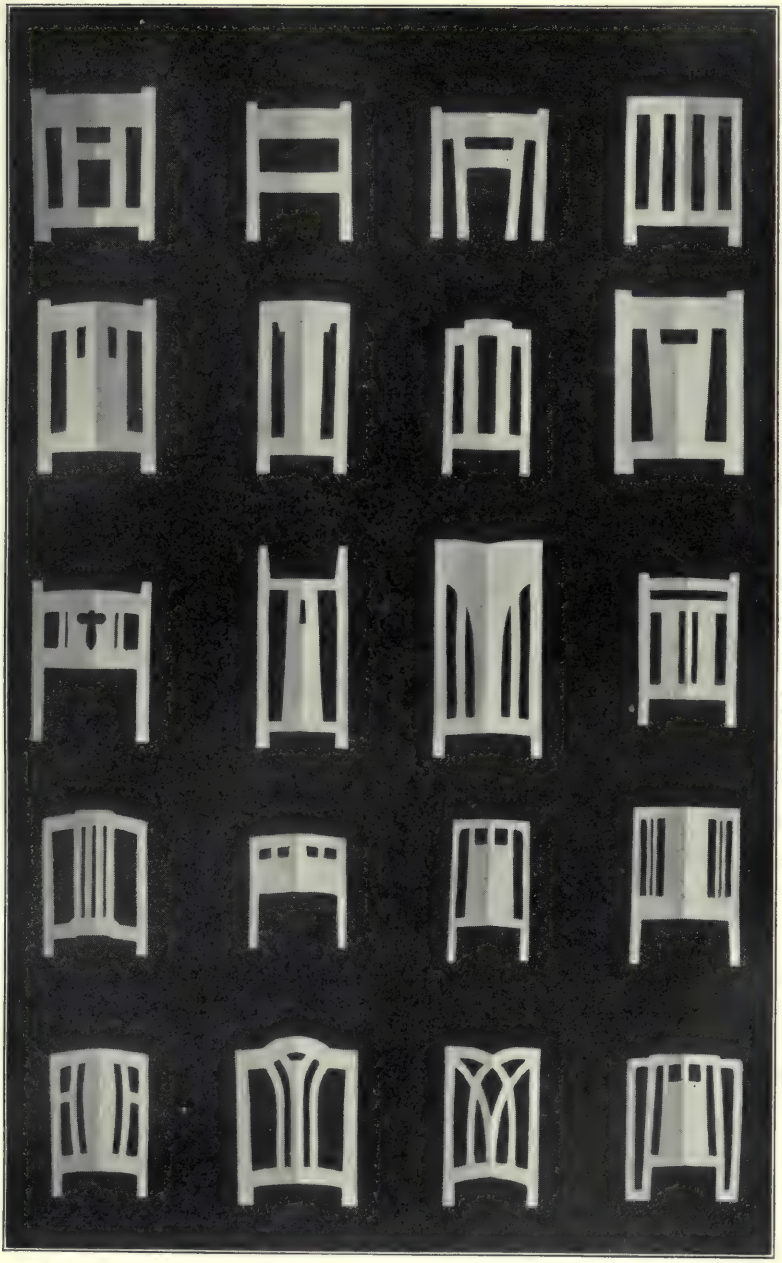


FIG. 12. CHAIR BACKS.

glue, and an experience with a glue-spotted piece is the most effective preventative of carelessness in glueing. The paper will not take a water stain readily. An oil stain containing some varnish is better. We have used a varnish stain, thinned with gasoline, for it has proved more satisfactory than any other which we have tried. It has the advantage of mixing well with small quantities of oil paint so that different colors can be produced. A caution about the use of gasoline may not be amiss. It is better to have the staining done by groups working from the same dish of stain, as it does not evaporate so rapidly from one vessel and there is less danger of fire. It would be better still if the staining could be done outside of the schoolroom. The stain may be applied with an ordinary camel's hair brush and superfluous quantities removed with a cloth wet in gasoline.

SUMMARY.

In this article, the chair, the bookcase, the library table and the arm chair are given, providing material enough for a simple living room. The piano bench is a variation of the proportions of the table; the davenport, of the arm chair. The piano is different in its construction from either, but not especially difficult.

The dining room shown in this number presents new forms of construction in the round table, and in the buffet. The vases shown in this room and in the living-room were developed by different children in the same lesson, showing how, in articles which need not be in sets, or each child may construct his own design.

GENERAL DIRECTIONS.

Following Directions:—Read and follow directions one step at a time.

Slip a blank sheet of paper down over the directions, covering each step in turn as soon as it has been worked out. This will keep the place marked, save much time, and many mistakes.

Before drawing a line find it in the pattern.

After drawing a line compare it with the pattern.

Note where lines end.

Measuring:—As rulers are apt to be marred or inaccurately spaced at the ends, do not use the ends in measuring, but let the measurements begin with any inch mark on the ruler.

Example—See Fig. 3. To mark a point on the left edge of the paper 1″ from the bottom.

Rulers such as draftsmen use, with the plain wood extending at each end beyond the markings, which simplify the measuring, are now on the market at a reasonable price.

Much is gained by learning to measure in either direction along the ruler. An inch is an inch whether counted backward or forward.

To Mark A Point:—To make sure that the pencil touches the paper exactly at the desired division of the ruler, the head should be held so that you look directly downward when marking a point. If looking at a slant, the point is apt to be placed too far one way or the other. The pencil must be sharp and held vertically with its point against the measuring edge of the ruler. Mark the point by twisting the pencil slightly between the thumb and finger without sliding the point of the pencil on the paper in any way.

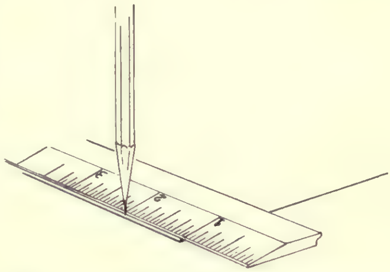


FIG. 3. MARKING A POINT AT LEFT EDGE OF PAPER 1″ FROM BOTTOM.

Two points must be marked to place any line. The farther apart the points can be placed the more accurate will be the direction of the line.

To Draw With The Ruler:—Lay the ruler so that its edge will touch the lead of the pencil held vertically on the points marked for the line. Adjust the ruler carefully to the points at *both* ends of the line before drawing the line.

FIG. 4.

While drawing, the pencil should be almost vertical. If it slants at all the slant should be in the direction in which the pencil moves.

The ruler should be held in place with the fingers spread far apart to keep it from slipping when drawing. See Fig. 4.

Draw vertical lines with the ruler placed at the left of the points.

Draw horizontal lines with the ruler placed just below the points.

Use of the Triangle:—To erect a vertical line on a base line—Place the triangle so that one of its shorter sides lies with its full length exactly along the base line. The right angle of the triangle should

FIG. 5.

touch a pencil standing on the point at which the vertical is to be drawn. The point should not be under the triangle. See Fig. 5.

Starting from the point draw the line along the free side of the right angle.

The triangle may be used in the same manner to draw a line at right angles with any other line.

To Extend a Line:—A line drawn along the full length of a triangle or a ruler may be too short. To extend such a line, lap one end of the ruler and the line at least 3″ so that the pencil point traveling

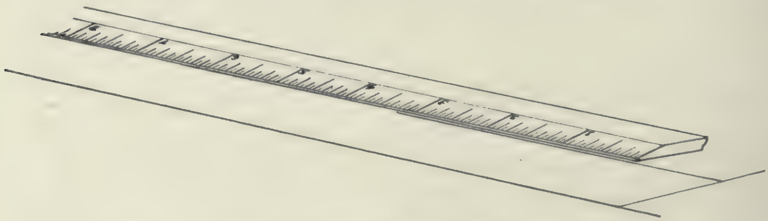


FIG. 6. METHOD OF PLACING RULER TO EXTEND A LINE.

along the ruler edge passes exactly over a portion of the line already drawn. Continue drawing until the line is the required length. See Fig. 6.

To Test for Verticals:—On both lines drawn for verticals mark points at equal distances from the base line. Measure the distance between the points. If this distance is not exactly the same as between the lines at the base line apply right angles as before to discover error. The incorrect line can be properly adjusted.

Meaning of Lines in Pattern:

Heavy full lines are cutting lines.

Heavy broken lines are scoring and folding lines.

Light lines are working lines.

Light lines with arrows are dimension lines and the dimension given shows the distance between the arrows.

Scoring:—Lines are scored to aid in making a neat fold. Place ruler as if to draw over the line. Trace over the line with the rounding back of a scissors blade. A little practice will show how lightly you need to score to make an accurate fold. Do not scratch the paper or it will break. Try on a piece of waste paper first. Score all lines as indicated before cutting.

Cutting:—Begin by cutting away large waste pieces outside of the pattern.

When cutting openings, push the blade of the scissors thru the center of the opening and cut away a smaller hole than the one required. This done, cut out accurately, along the final edges of the opening, cutting toward corners.

To cut a line at the right side of waste hold scissors above the paper.

To cut a line at the left of waste hold scissors below the paper.

Do not cut around a corner; cut to the point from both sides.

Folding:—Fold *all* scored lines before *any* pasting is done. Fold as follows:

On a dotted scoring line......fold the paper with the line on the inside.

On a dashed scoring line — — — fold the paper with the line on the outside.

Hold sections of the form together to see if all parts fit exactly before pasting any. If there is difficulty in folding one part over another, this can sometimes be remedied by slightly trimming the inner parts.

Pasting:—With a stiff piece of waste paper or flat sliver of wood spread glue very carefully on *one* part to be pasted.

Spread the glue very thinly to make it dry quickly and not ooze out beyond the laps.

Turn the form in any position that will enable you to press the glued parts together against some flat surface. See figures of pasting.

In case the glue should show where it is not wanted a damp cloth applied gently will remove the stain.

DIRECTIONS FOR MAKING STRAIGHT CHAIR.

Paper 6″ x 10½″. Lay with long edges horizontal.

Base Line:—On right and left edges mark points ¼″ from bottom of paper.

Connect by horizontal line.

On base line mark a point ½″ from left edge of paper and another point 9″ farther toward the right.

Erect vertical lines from these points to top of paper, using triangle. See Fig. 5 and General Directions.

Top Line:—On verticals mark points 5″ above base line for top of chair. Test verticals at these points. See General Directions.

Thru points draw a horizontal across the paper.

Main Vertical Sections:—Mark points dividing base and top lines between the verticals into four 2¼″ spaces.

Thru points draw verticals from base to top of paper.

At top of paper and beginning at the left letter verticals respectively A, B, C, D, and E. See Fig. 7.

FIG. 7(A). STRAIGHT CHAIR IN PERSPECTIVE.

Seat Line:—On lines A and E mark points 2¼″ above base line. Thru points draw a horizontal across the paper. At left of A letter this horizontal X.

Seat:—On B and A mark points 2¼″ above X for depth of seat, then ¼″ higher for pasting lap.

Connect by horizontal lines.

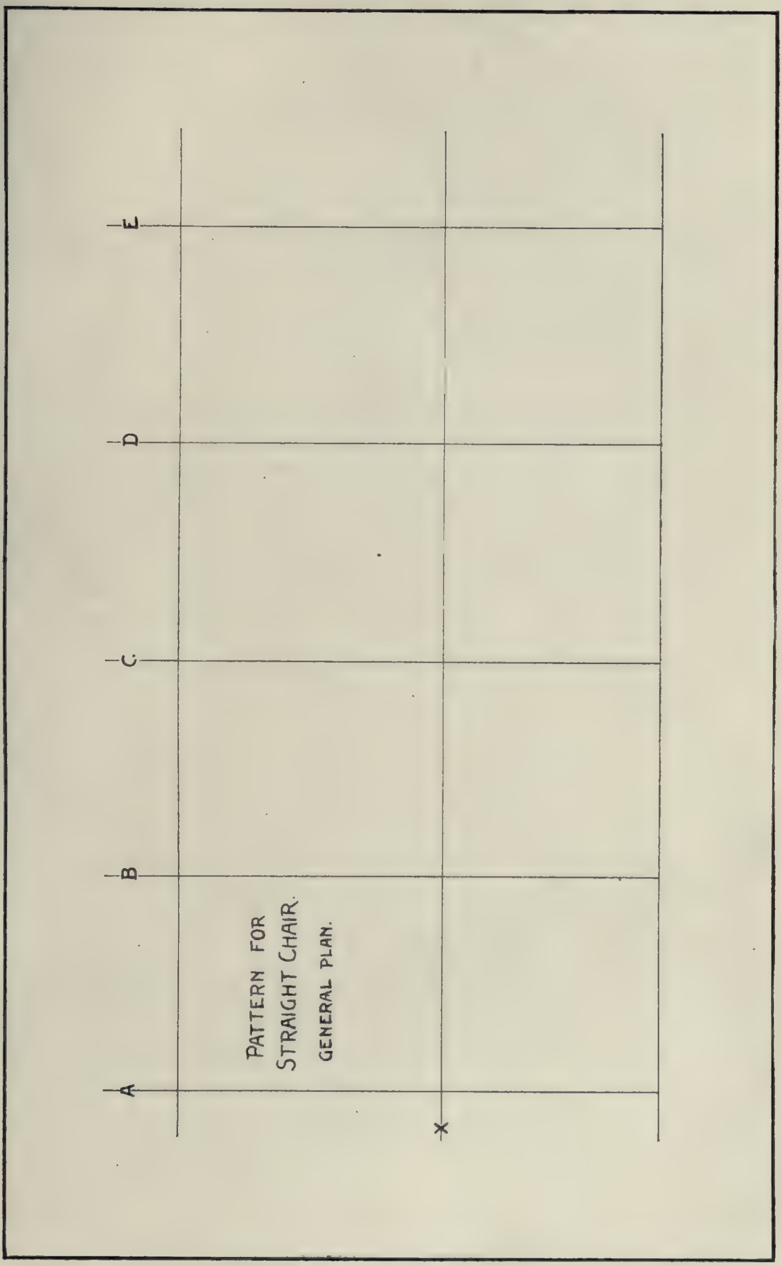


FIG. 7.

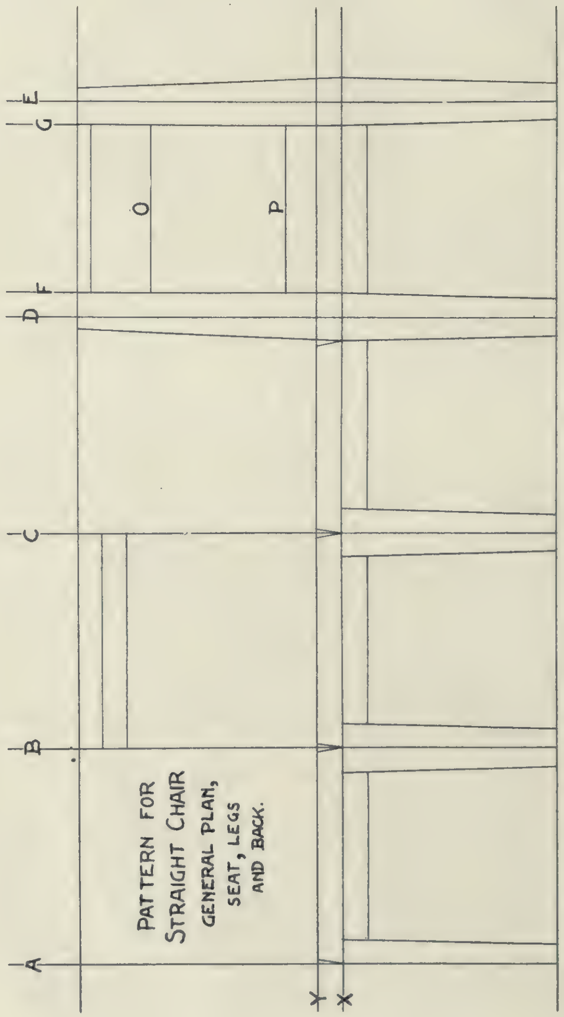

PATTERN FOR
STRAIGHT CHAIR
GENERAL PLAN,
SEAT, LEGS
AND BACK.
A
B
C
D
F
G
E
O
P
Y
X

FIG. 8.

Legs:—On X mark points ¼″ at right of A and on each side of B. C. D, and E.

On base line mark points $\frac{3}{16}$″ at right of A and on each side of B, C, D, and E.

Draw oblique lines to connect points on X with corresponding points on base.

Seat Rail:—On A and E mark points ¼″ below X. Lay ruler to draw a horizontal thru these points but draw only in spaces between legs. See Fig. 8.

Pasting Laps:—On A and E mark points ¼″ above X. Thru points draw a horizontal line across the paper.

At left of A, letter the line Y. Mark waste on ends of pasting laps. See Fig. 8.

Uprights of Back:—On top line mark points ⅛″ at left of D and at right of E.

Draw oblique lines connecting these points with top of leg lines below on X.

On top line mark points ¼″ at right of D and at left of E. Thru points draw verticals to top of leg lines on X. Above top line letter left vertical F and right one G.

Pattern of Back:—Designs may be original if desired.* If the pattern is to be carried out as shown.

On F and G mark points ⅛″ below top line, then ⅝″ lower. Connect by horizontal lines.

At center, letter lower line O. See Fig. 8. On F and G mark points $\frac{5}{16}$″ above Y. Connect with a horizontal. At center letter this line P. If a very simple back is desired it is necessary to add only one more horizontal rail between the two already placed.

For pattern as in Fig. 9.

On O and P mark points ¼″, then $\frac{5}{16}$″ farther toward center of back from both F and G.

Connect with verticals.

On center verticals mark points ¼″ below O, then $\frac{5}{16}$″ lower. Connect with horizontals.

Rungs:—On B and E mark points 1⅛″ above base line then ¼″ higher.

Lay ruler to draw horizontals thru points but draw only between legs in sections under seat and back of chair.

On A and D mark points ⅝″ above base line, then ¼″ higher.

* Suggestions for original designs are given elsewhere in this article. See also Fig. 12.

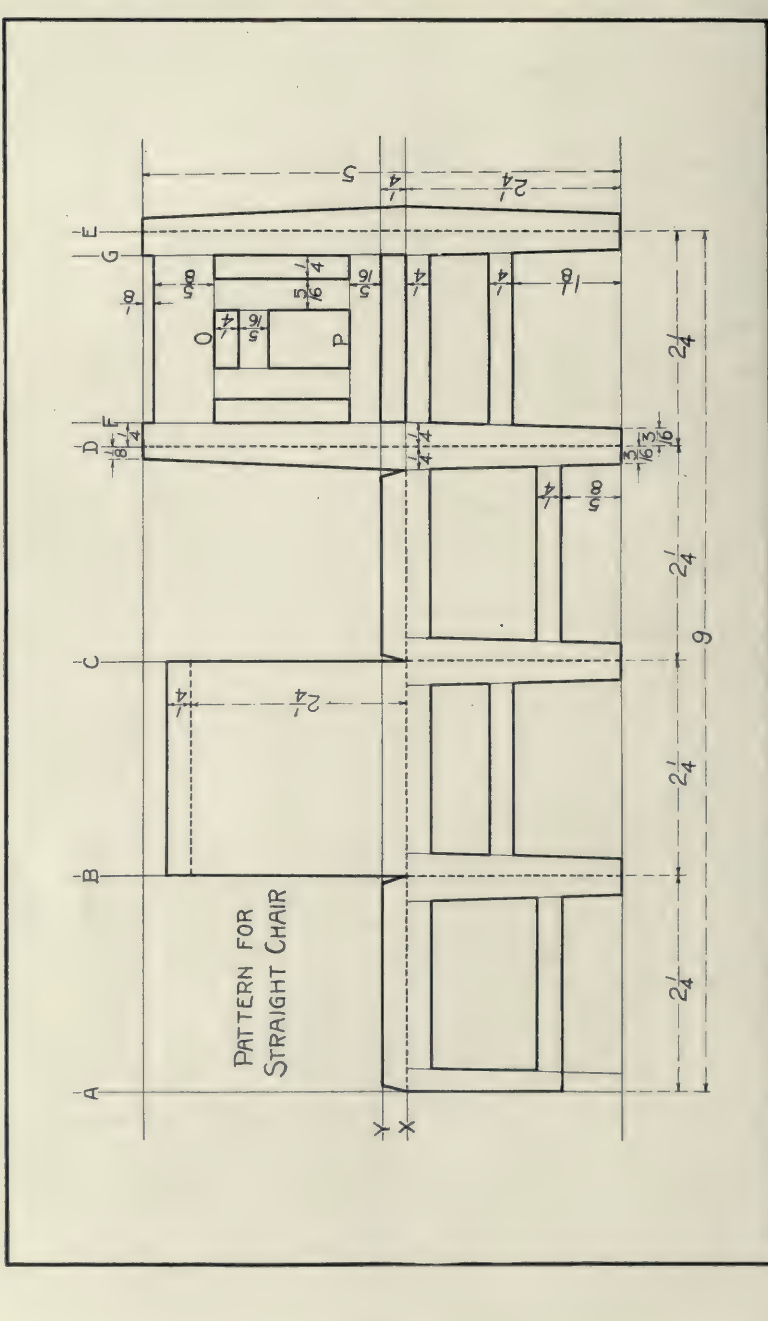


FIG. 9.

At these points draw horizontals only between legs of remaining two sections extending lower line to A in section at the left.

Final Details:—Mark all heavy full lines and heavy broken lines as in the pattern.

Score, cut, and fold as indicated. See General directions.

Hold pattern folded to show form of chair. Note position of parts.

If the back folds around seat with difficulty trim the sides of seat slightly.

FIG. 10. A PATTERN CUT, FOLDED, AND READY TO PASTE.

Order of Pasting:—1. Paste lap of middle short section under the seat. Figs. 10 and 11.

2. Paste lap of end short section under the seat.

3. Paste lap at back of seat to seat rail on the back of chair.

4. Spread glue on *short* piece of leg at open corner and paste under side strip of back.

DIRECTIONS FOR MAKING BOOKCASE.

THE FRAME.

Paper:—8 x 10¼″. Long edges horizontal.

Base Line:—Points on vertical edges of paper ¼″ from bottom. Connect by horizontal line.

Back Section:—On base line, points 2½″ from the left edge of the paper and 5½″ farther toward the right. Erect verticals A to the top of paper. Use triangles. See Fig. 13.

Top Line:—On verticals A, points 6¾″ above base line.

Test Verticals.

Draw horizontal thru points.

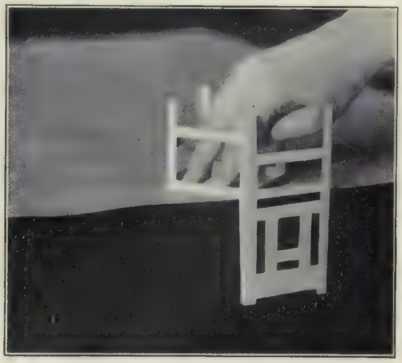


FIG. 11. HOLDING FORM SO THAT LAP MAY BE PRESSED AGAINST A FLAT SURFACE WHILE DRYING.

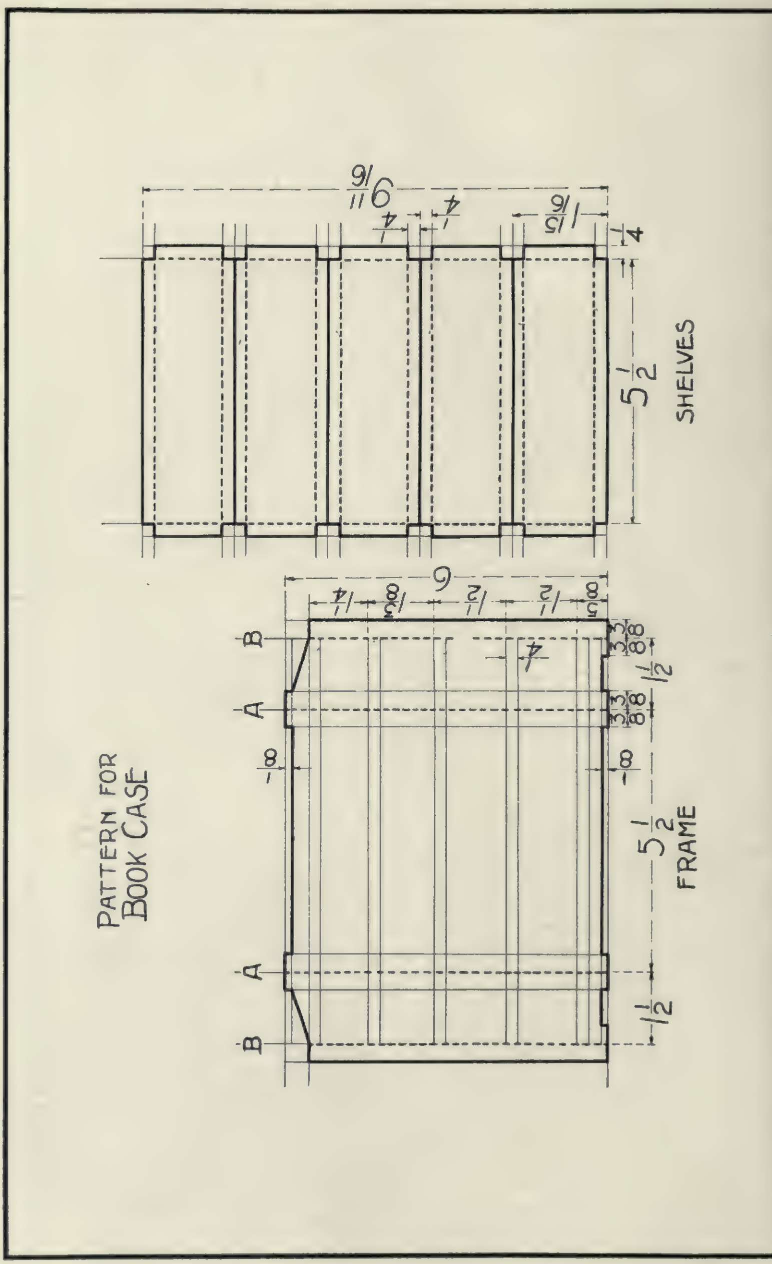


FIG. 13.

Side Sections:—On base and top lines, points 1½″ outside of A. Draw verticals B.

Shelf Lines:—Beginning at bottom, points on lines B. at spaces as follows: 1½″, 1½″, 1⅜″, 1¼″.

Connect by horizontals.

Pasting Lines:—On lines B, points ¼″ below each shelf line.

Connect by horizontals.

Feet, and Projections at Top:—On lines B points ⅛″ below the top line and above the base. Connect by horizontals.

On base and top lines points ⅜″ on each side of lines A and outside of lines B. Connect by verticals. On base and next horizontal, points ⅜″ inside of lines B.

Connect by verticals.

Oblique lines at top as shown.

Mark cutting and scoring lines.

Score, cut and fold as indicated.

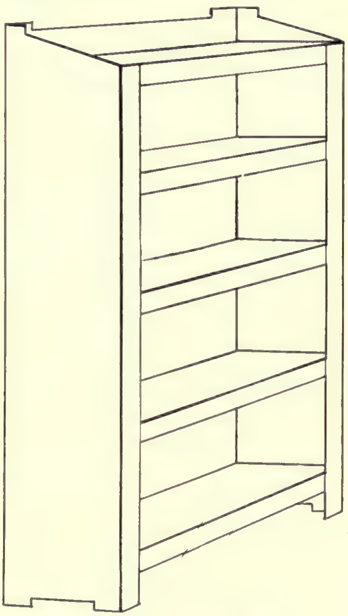


FIG. 13 (A). BOOK CASE.

SHELVES.

Paper:—7″ x 11″. Short edges horizontal.

Base Line:—Points on vertical edges of paper ¼″ from the bottom. Connect by horizontal line.

Shelf Length:—On base line, points ¾″ from the left edge of paper and 5½″ farther toward the right. Erect verticals to top of paper. Use triangles.

Top Line:—On verticals points $9\frac{11}{16}$″ above base. Test verticals.

Horizontal thru points.

Shelf Sections:—Points dividing both verticals between base and top line into five 1-11/16″ spaces.

Horizontal thru points.

Pasting Laps:—On both verticals, points ¼″ above each horizontal except the top and ¼″ below each horizontal except the base.

Horizontals thru points.

On top and base lines, points 1/4″ outside of both verticals.

Verticals thru points.

Mark cutting and scoring lines.

Score, cut and fold as indicated.

Order of Pasting:—Paste one long lap of one shelf between the top pair of pasting lines on the back section of the frame. See that the lap will be under the shelf when finished.

Paste remaining shelves one below the other in a like manner within the remaining pairs of pasting lines. Fig. 14.

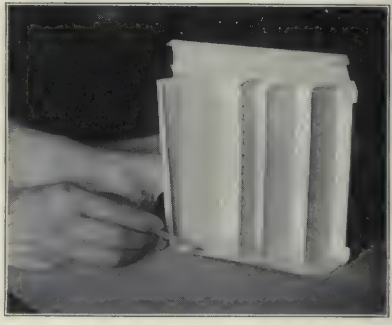


FIG. 14. PASTING IN THE SHELVES OF THE BOOK CASE.

Paste the left lap of the top shelf between the pasting lines on the left side of the frame. See that all shelf laps turn down.

Turn the frame on the left side with the shelves facing you. Fig. 14.

Push the front of the second shelf toward the left, exposing the second pair of pasting lines on the side of the frame.

Spread glue between the lines to the front strip, not farther.

Push the shelf back and hold in place until dry.

Repeat with the remaining shelves.

Turn the frame on its right side.

Paste shelves to the right side of the frame in the same manner but begin with the bottom shelf.

Fold the front strips over the front of the shelves.

Mark with a pencil the portion of the front laps of the shelves to be covered by the strips. Spread glue rapidly down one side of the shelves on that part covered by the strip.

Fold the strip over and press and pinch the laps against the strips until dry.

Repeat with the other side.

ARM CHAIR.

ORDER OF STEPS IN DRAWING PATTERN.

SEAT.

Paper:—4″ x 5″. Long edges horizontal.

Front Edge of Seat:—Horizontal X, ¾″ from bottom of paper. Points on X ¾″ from left edge of paper and 3″ farther toward the right. See Fig. 15.

Depth of Seat:—Halfway between points erect vertical A on Y. Use triangle.

At point on A, 2⅝″ above X, draw line at right angles with A. Use triangle.

Extend this horizontal line on both sides of A. Letter Y.

Sides of Seat:—On Y, points 1¼″ on each side of A. Thru points draw oblique lines to points on X.

Front Rail:—Verticals to bottom of paper from ends of seat on X. Use traingles.

Horizontal ½″ below X.

Pasting Laps:—Points ¼″ up on obliques from Y. Connect by horizontal.

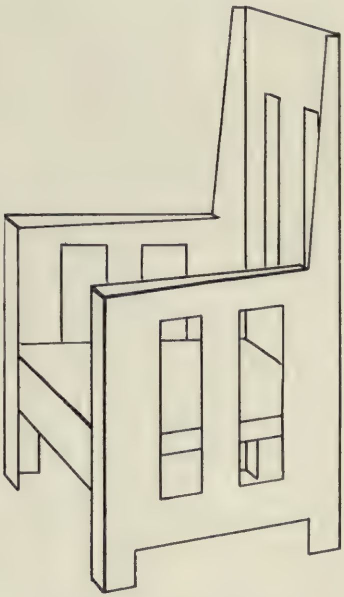


FIG. 15(A). ARM CHAIR.

Points on X and Y ¼″ outside of obliques. Connect by obliques.

Mark waste at bottom of side laps.

Mark cutting and scoring lines as shown.

Score, cut and fold as indicated.

FRAME.

Paper:—6¼″ x 9½″. Long edges horizontal.

Base Line:—Horizontal line ¼″ from the bottom of the paper.

Back Section:—Erect verticals A on the base line. 3½″ from the left edge of the paper and 2½″ farther toward the right. Use triangles.

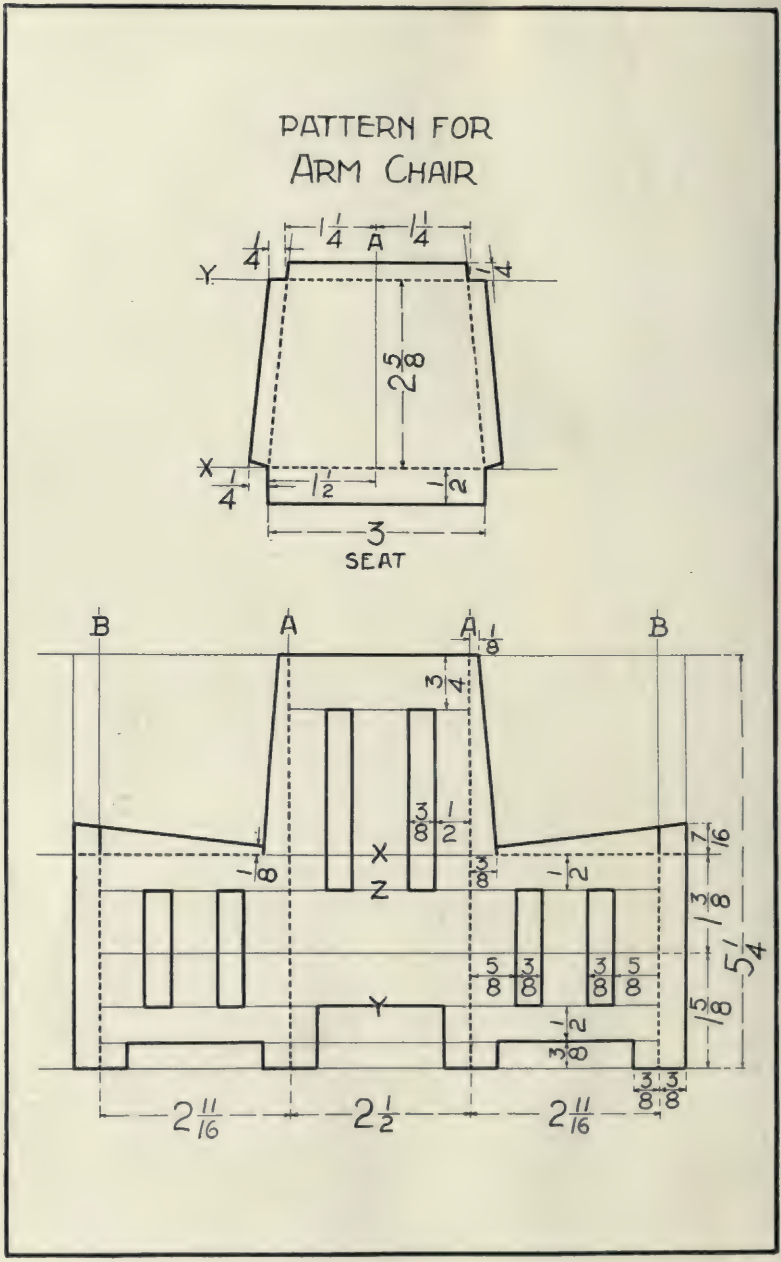


FIG. 15.

Top Line:—Horizontal line 5¼″ above the base line. Test verticals.

Side Sections:—Verticals B.

Seat Line:—Horizontal 1⅝″ above the base line.*

Arm Height:—Horizontal X.

Legs:—Horizontal line ⅜″ above the base line.

Horizontal Y.

Vertical lines of legs ⅜″ from A and B.

Pattern of Back:—May be original If as shown:—Horizontal line ¾″ below top line.

Horizontal Z.

Vertical lines of back openings.

Oblique lines on sides of back.

Pattern of Sides:—Vertical lines of openings in side sections.

Arm Rest:—Oblique line above side section.

Mark cutting and scoring lines as shown.

Score, cut and fold as indicated.

Order of Pasting:—Paste the small lap at the end of the arm rest under the slanting top strip. Trim the projecting corners.

Paste the laps on the back of the seat to the back section of the chair so that the top of the seat is on a level with the seat line of the frame. The lap should be under the seat when pasted.

Fold the side sections over the side of the seat.

Mark with a pencil where the edges of the side openings fall on the seat laps. Also where the edge of the front leg falls on the front rail of the seat.

Spread glue on that part of one seat lap and front rail which will be covered by the frame. Turn the chair on its side. Fold in place, press ,and pinch until dry.

Repeat with the other side.

Cushion:—Cut a piece of strawboard the shape of the seat, but slightly smaller. On one side lay cotton, extending a thin top layer over the edges and pasting it on the under side of cardboard. Cover with tissue paper of harmonious color pasting neatly on the under side.

* This chair is planned to be furnished with a cushion, if no cushion will be added, raise the seat line ⅜″, but keep line X the same distance from the base-line that is shown in the drawing.

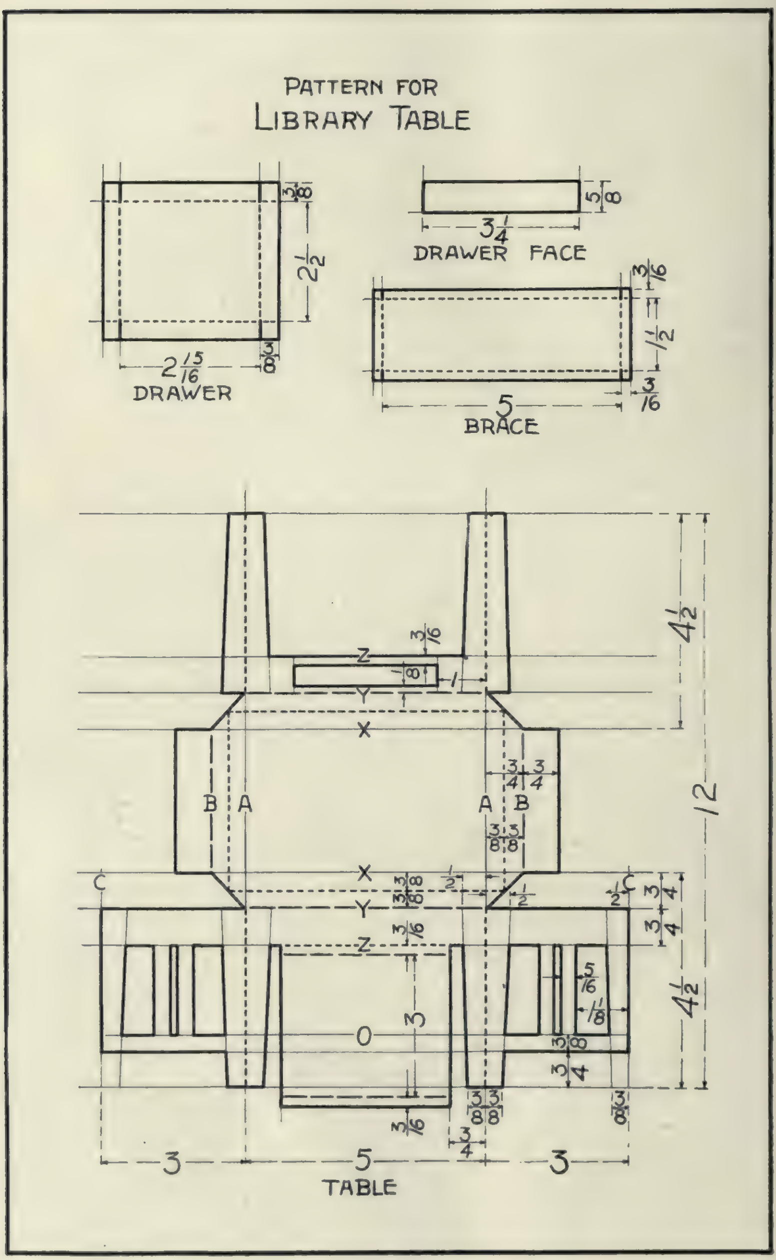


FIG. 16.

LIBRARY TABLE.

ORDER OF STEPS IN DRAWING PATTERN.

Paper:—12″ x 13½″. Short edges horizontal.

Base Line:—A horizontal line ¾″ from the bottom of paper.

Middle Section:—Erect verticals A on base line, 3½″ from the left edge of the paper, and 5″ farther toward the right. Use triangles. See Fig. 16.

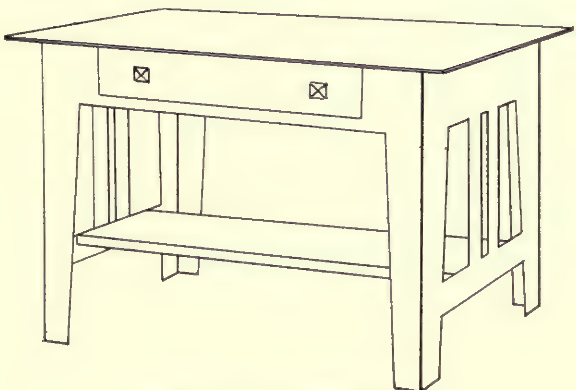


FIG. 16(A). LIBRARY TABLE.

Top Line:—Horizontal line 12″ above the base line. Test verticals.

Table Top with Projecting Edges:—Horizontals X, 4½″ below top line and above the base.

Horizontals Y.

Verticals B.

Diagonal lines across the corners.

Points on lines A, half way between X and Y.

Thru points draw horizontal lines ending at diagonals.

Verticals between lines A and B ending at diagonals.

Legs:—The oblique lines on each side of lines A above and below the table top.

Rails:—Vertical lines ¾″ outside of lines B.

Horizontals.

At this point the pattern has all the necessary lines for a plain table and can be finished as such if desired.

For the Side Panels:—Verticals C.

Oblique lines just inside of lines C.

Horizontal line ¾″ above the base.

Horizontal O.

Vertical lines of openings in panels.

At this point the pattern is complete if no drawer is desired.

If a drawer is to be added:

Drawer Opening:—Vertical lines 1″ inside of lines A between upper Z and Y.

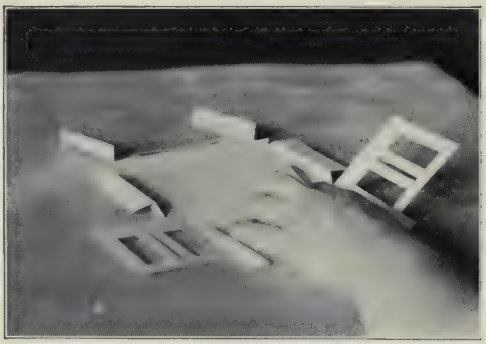


FIG. 17. PASTING THE LIBRARY TABLE TOGETHER.

Horizontals ⅛″ above upper Y and $\frac{3}{16}$″ below upper Z.

Drawer Support:—Verticals from Z to the bottom of the paper ¾″ inside of lines A.

Beginning at Z space downwards on last verticals as follows: $\frac{3}{16}$″, 3″ and $\frac{3}{16}$″.

Connect points by horizontal lines.

Mark all cutting and scoring lines. Score, cut, and fold as indicated.

DRAWER.

Paper:—4″ x 4½″. Long edges horizontal.

Bottom of Drawer:—Horizontal line ¾″ from the bottom of the paper. Erect verticals ¾″ from the left edge of the paper and 2-15/16″ farther toward the right. Use triangle. Horizontal line 2½″ above the first horizontal. All lines should extend to the edges of the paper.

Slides of Drawers:—Add ⅜″ strips on all sides of the oblong drawn.

Score, cut, and fold as indicated.

DRAWER FACING.

Construct an oblong 3¼″ x ⅝″. Cut.

BRACE.

Paper:—3″ x 6½″. Long edges horizontal.

Main Section:—Horizontal line ½″ from the bottom of the paper. Erect verticals ¾″ from the left edge of the paper, and 5″ farther toward the right. Use triangle. Horizontal line 1½″ above the first horizontal. All lines should extend to the edge of the paper.

Laps:—Add $\frac{3}{16}''$ strips on all sides of the oblong drawn.

Score, cut, and fold as indicated.

Order of Pasting:—Spread glue on the strip of the drawer support adjoining the table. Fold back on the rail. Press against a flat surface until dry. Fig. 17.

Spread glue on the inside surface of the folded ledge along one side of the table top. Fold halves of ledge together and press with table top down. Fig. 18. Repeat with remaining three sides.

Paste top of panels to side rails.

Paste loose strips of legs over the sides of the panels. Paste the loose side of the drawer support on the under side of the rail pierced by the drawer opening.

Paste the drawer pattern together. Mark with a pencil where one long side of the drawer will paste against the drawer face. Paste.

Paste the brace laps to form a shallow tray. Turn with laps down.

Fit the brace between the lower rails of the side panels.

Mark its position on the panels.

Paste.

(*To be continued*)

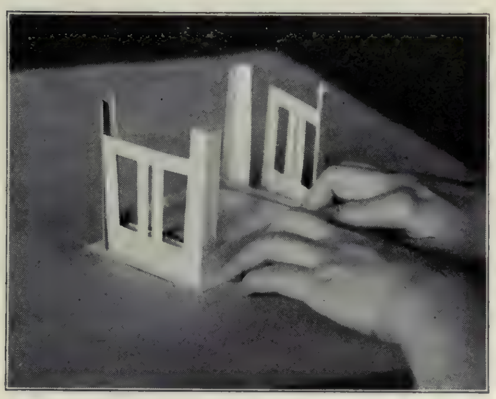


FIG. 18. PASTING THE LIBRARY TABLE TOGETHER.

SLOYD AN IMPORTANT FACTOR IN THE EDUCATION OF BOYS.

GUSTAF LARSSON.

A RECENT interesting article upon educational methods calls attention to *the need of more effective moral training in the education of the American boy,* beginning with the statement that, "No other age of the world has ever made such demand upon *character* as does the age in which we live."

Another writer on this subject says:—"A sort of industrial craze is now hurrying undeveloped boys into mechanical work from which there is danger of *teaching them "the tricks of the trade before establishing habits based upon definite standards of excellent workmanship."*

Within the last few years many agencies and societies have sprung up, working with an earnest purpose of increasing the scope and efficiency of the public schools, thereby enabling them to cope more effectively with the demands of our increasingly complex civilization.

We have such organizations as the National Society for the Promotion of Industrial Education, making a great propaganda for the increase of industrial and vocational efficiency in our young people. We have vocational bureaus for investigating particular kinds of work which young people may be fitted to enter. State Legislatures are considering the advisability of establishing industrial and technical schools.

Delegates sent abroad to study the conditions of industrial and technical education and the results obtained, return with enthusiastic reports of the work accomplished there and emphatically state that we must change and add a great deal to the equipment and methods of our technical schools in order to compete with the efficiency of the well trained workers of European countries.

There seems to be a growing tendency to introduce into our schools such methods of work as are used in the great industries and factories, with the belief that our boys and girls will thereby be fitted for wage earning as soon as they leave school. This purpose is perhaps good and I agree that one of the ultimate aims of all education should be to enable our children, *at the proper age,* to earn a decent wage. Furthermore, investigation seems to show that seven out of every eight boys

and girls in the United States leave the grammar schools to enter upon the serious business of earning a living. In view of this fact it seems necessary to concentrate our teaching upon the boys and girls before they leave the grammar schools and to give them such work as will prove most effective in establishing a foundation for industrial intelligence, and high standards of workmanship.

There is always danger in appealing to the money making side of a child's nature because such a motive is likely to check the effort to obtain a more complete education. At this age, many children are tired of the routine of regular school work and are readily satisfied with a moderate earning power, the result of which is likely to doom them to the ranks of low class labor. When too late to increase his earning capacity the low-wage earner wakes to the realization that his wage falls sadly short of providing for himself or those dependent upon him.

In all profit making industries, highly specialized machines are taking more and more, as they should, the place of human effort. The worker is fitted to the machine and rapidity of production is the chief thought of the captain of industry. I admire the wonderful American inventions in tools and labor saving contrivances which make this nation economically most prosperous. But we are making a grave mistake if we introduce these modern methods of rapid production into our elementary schools. It is only thru human effort and by appealing to human motives and standards that we can develop at the same time human power, true culture and industrial efficiency.

The manual training schools which have grown up in this country during the past twenty years were intended to make the education of boys "more practical," at the same time keeping the general educational idea in mind. They have failed, so far, to realize this purpose as they are able to reach but a comparatively small number of boys, generally *one school* being selected for such work in each large city.

In view of the changing tendency in the educational methods of our times these schools do not seem to supply the necessary instruction demanded, either educationally or technically. It may be of interest to quote a few remarks from reports concerning the aims and methods of these schools. One report says, "Tool instruction is the distinctive feature of the school, each exercise involves a mechanical principle and the chief object of the instruction is the development of the principle rather than a finished piece of work." The idea of making anything useful in these manual training schools was carefully avoided for fear

of detracting from the purely educational end in view. This was one reason why the promoters of manual training did not welcome sloyd when it was introduced into this country more than a score of years ago.

Further it was stated that "tool instruction is a series of exercises based upon and accompanied by an analysis of three things—the tool, the material, and the elements of construction. If we add to this basis of three things a fourth, viz: the boy himself, we have the sufficient basis for both the method and the content of American manual training."

Sloyd on the other hand bases its methods always upon the *individual worker*. His ideas and feelings as well as his capacity for work must always be the first consideration.

The old New England farm life, where boys and girls had to attend to important duties better illustrates the idea of the aim of sloyd in the schools. We have many examples of strong men, leaders both in education and industries who trace their success to the early training on the farm. Years ago the curriculum of the public schools seemed to contain all that was necessary for the school to supply, still the greater part of the boys' real *education* was obtained outside of the school. Conditions have changed and today the opportunities for training out of school have decreased considerably. The large cities are crowded with children who have little or no opportunity to do any work with their hands, even on the farm the opportunities for hand-work being less owing to the general introduction of machinery.

We are only beginning to realize the value of manual work in the development of boys and girls. More than that we have learned that such work must be given before the age of fifteen or eighteen in order to get the best general development demanded of our times. Sloyd will therefore fill an urgent need in the school curriculum as it is calculated to give thru its well considered progressive methods, a solid foundation for any subsequent calling. This, I believe, is best done thru methods, the chief aim of which is ethical rather than technical and to give a general development rather than immediate specialized skill. It also insists upon teachers being qualified in the art of teaching, as well as in the technique of the subject matter.

Every object made should include the three elements, namely, good design, simplicity, and use. Proper attention should be given to the physical development of the boy and each individual should progress according to his ability and needs.

The value of these common sense ideas has not been sufficiently

emphasized in any manual training scheme outside of sloyd to my knowledge. It is, however, coming more and more to be recognized. Indeed, the modern methods of teaching the so-called culture subjects have sometimes been reinforced and vitalized by acquaintance with the fundamental principles and methods of the sloyd schools, where high standards of excellence are secured as well as the formation of correct working habits from the outset.

In the teaching of sloyd, the teacher insists that *the first impression of the purpose and method of using a tool should always be clear, correct and effective.* Educators everywhere recognize that there is room for improvement in the work of the public schools. A general waking up and a greater interest in the subjects already taught is sometimes demanded. It has also been recognized that, wherever competent teachers are employed, sloyd has a generally effective *awakening* power with children. The desired result cannot be brought about, however, either educationally or technically, by devoting only one or two hours a week to the work, or with poorly qualified teachers, or other poor conditions.

Many European schools devote from six to eight hours a week to manual training in the upper grammar grades with the result that many young men thus trained are to my knowledge fitted for the skilled industries of this country, with high wages, with no other industrial training than that received as boys in some of the public schools of Sweden.

In order to obtain the wished for result in this country, methods must be used which will make for honesty and manliness, qualities always first in demand by employers. Interest must be aroused and sustained by means of such problems as will encourage *good work for its own sake,* as well as unwillingness on the part of the worker to accept from himself anything but his very best. The boy should be led to examine his work critically and to judge of its value, making a written report in regard to it. The development of the critical faculty is very striking.

If such ideas as these could be carried out more strictly in our public schools, we believe we should come nearer to solving the problem of vocational efficiency while planting the seed of truthfulness, contempt for poor work, self-respect, and honesty, in the minds of our boys and girls.

I have occasional letters from manual training teachers asking what to do in certain emergencies, as for instance when the school authorities

demand that the children in the manual training classes shall produce things needed in school, the equipment needed in the manual training room and laboratory, or articles needed as school supplies in the cities. I always feel that special teachers should obey superiors even when it does not harmonize with their own views, but I also feel that when such orders are obeyed without consideration a great deal of mischief may be unconsciously done and both teacher and pupil must suffer. The demand that certain school supplies be made by children, generally results in the teacher having the largest part of the work to do, either by minute directions and restraint or by actual participation in making the most difficult part of the objects or, by resorting to machinery.

Such work is often praised at exhibitions as being "very practical" and "economical" and therefore "educational," altho the finished product may represent ten per cent. pupil and ninety per cent. teacher and machinery. If in some pieces of furniture it should represent fifty per cent. child effort it is generally such poor work that it has no durability or usefulness. Some conscientious teachers object to helping the boys to manufacture things under the pretense that it is the boys' own work. I have heard of cases where the teacher is supplanted, however, by a carpenter who is willing to undertake such work. Such cases as these are pitiful as they lead to dishonesty of the worst kind. The manual training teacher's stand should be that whenever a need of any kind is presented by his superiors, he should see that the work fits in, as the next thing in the child's progress. Then it may become an inspiration and a valuable work for a boy's training as well as desirable economy. The making of furniture and other large objects, however, should be taken up only at a time when the boy can make them, *by himself* and make them well.

I noticed a statement some time ago, made by a person who has investigated the labor question in several countries, and he says, "The United States need not worry about prosperity—rather it should worry about the scarcity of *high grade labor.*" We also know of investigations in several establishments where high grade work is demanded that the most skillful workers and foremen are as a general rule foreigners. In spite of these facts we are probably spending here larger sums of money for education than any other country, yet we do not always come up to other countries in standards of industrial efficiency. The probable cause is that we are inclined to be influenced in our schools by the speed of our great commercial enterprises, hurrying children thru without getting the complete development demanded in standards and efficiency.

An investigation I made recently concerning the character and quality of workmen such as are demanded by large manufacturers brought out the fact that such qualities as honesty, manliness, and intelligence are considered of *first* importance by such employers of labor rather than specialized skill. Out of fifty replies received, forty-five mentioned honesty as the first requirement, and then came, in the following order, industry, intelligence, manliness, truthfulness, ambition, self-reliance, good health, skill, systematic habits, a sense of order, and love for good work. We believe that these qualities are best developed thru educational manual training, which looks to the general development of the whole boy, the incidental result of which is skill of a *higher order* than is possible with more specialized early training, with *money* rather than excellence as its aim.

As there seems to be some confusion of ideas amongst teachers of sloyd and other forms of manual training it is important that some general principles should be adopted on which we all could agree, leaving individual teachers free, as far as possible, to carry out their own ideas. To this end I offer the following resolution:

Resolved:

1. That the manual work in the schools shall be such as will arouse and sustain interest.

2. That each problem be such as can be done *thoroly well,* and in a comparatively short time.

3. That the objects made shall be based upon the idea of usefulness, having also, if possible, the elements of beauty, such as good form and proportion.

4. That, as a general rule, each problem shall contain *not more than five* new tools, or exercises, and not less than *one.*

5. That the pupils, particularly in the higher grades, suggest individual problems.

6. That the boy's standard of excellence of workmanship shall make him his own best critic.

MARKET PLACE BUILDING OF THE MARYLAND INSTITUTE.

(The Institute Day Schools are housed in another ideally equipped building on Mt. Royal Avenue.)

In this building are conducted the Mechanical and Architectural Classes of the Night Schools. Located in the heart of the City, close to the homes of its artisan students, this structure is equipped for, and annually shelters, nearly a thousand students on two spacious, ideally lighted and ventilated floors.

ARCHITECTURAL DRAFTING IN THE MARYLAND INSTITUTE.

III. TRAINING IN FRAME CONSTRUCTION AND DETAILING.[1]

JAMES FREDERICK HOPKINS.

THE second article of this series outlining a portion of the course in architectural drafting in one of the oldest industrial art institutions in the country described a somewhat unique training in frame construction and illustrated a most comprehensive series of drawings at ¼″ scale. It was the purpose of that article to show how

[1] Copyright, 1912, by James Frederick Hopkins.

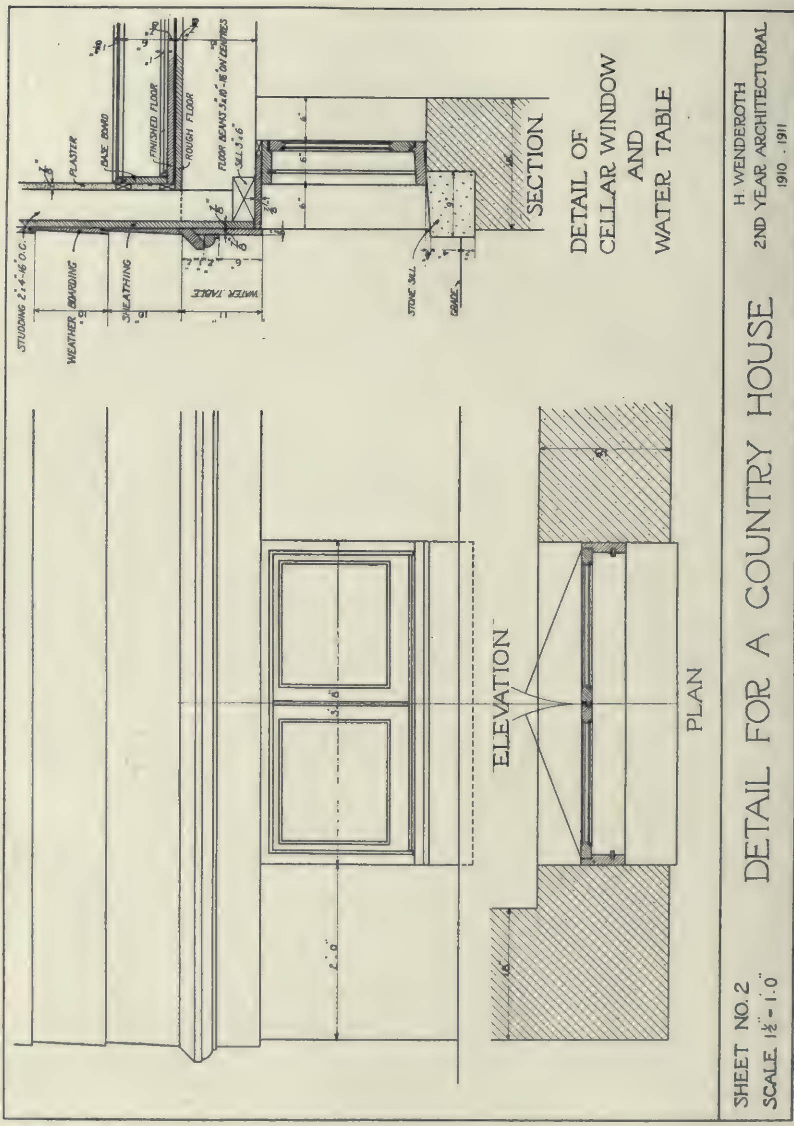
a consistent knowledge of related frame construction was built up from a careful study of structural details.

It is the purpose of the present article to describe briefly the continuation of this study of detailing and chiefly to outline the methods by which ¾″ scale studies are developed and thence on to the field of full size drawings prepared for the millman and the builder.

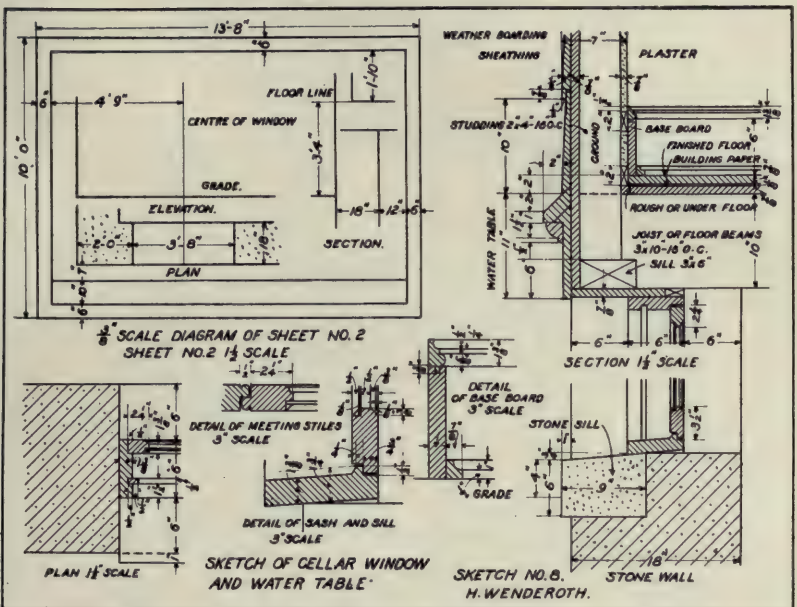
One of the interesting features of the Institute night schools is the number and variety of trades represented in its classes. This is particularly true in the Architectural Division, wherein altho the carpenters, bricklayers, plumbers, mills and lumber yards enroll the greatest number of students, yet the related trades, the dealers in hardware, the railroads, as well as the student and clerical class, all send in their quota of earnest workers. It is a time honored tradition of the school that the faculty shall be made up of only those men who are themselves identified with important undertakings, and all these influences have given a practical character to the courses which is very refreshing in earnest spirit and sincerity.

It is undoubtedly the practical character and vocational leanings of these courses which have led the teachers in charge to lay such stress upon extended practice in the making of detail drawings at all practical scales. This is a feature which has been so frequently overlooked in the planning of architectural courses, that students presenting themselves in professional offices in search of employment have frequently found it necessary to begin all over again in more practical courses of office methods under professional eyes in order to find employment and be of value in the daily routine of the average office. It is undoubtedly due to the fact that the majority of the Institute's teachers themselves leave their drafting rooms, their superintending or inspection offices, their construction sheds on important buildings to give their services in these night schools, that these courses present such unique methods of instruction and offer such opportunities for power building in the classrooms.

It would be an interesting opportunity if the reader could visit any one of these four large architectural classrooms while this study in construction and detailing was under way. Not only would the practical character of lighting and equipment appeal, but the generous character of the table surface would be sure to make its impression, for there is no difficulty in handling the largest of these full size details. Is it any wonder that the visiting architects—and the relationship between the


DETAIL FOR A COUNTRY HOUSE
SHEET NO. 2
SCALE 1½" - 1'-0"
H. WENDEROTH
2ND YEAR ARCHITECTURAL
1910 - 1911
DETAIL OF
CELLAR WINDOW
AND
WATER TABLE
SECTION
ELEVATION
PLAN
STUDDING
WEATHER BOARDING
SHEATHING
WATER TABLE
STONE SILL
GRADE
PLASTER
BASE BOARD
FINISHED FLOOR
ROUGH FLOOR

profession and these educators is close and sympathetic—spending an evening in our classrooms in late winter or early spring gain an impression that the classroom is only another well equipped office. On every side there are boys at work with coats off and sleeves rolled up,

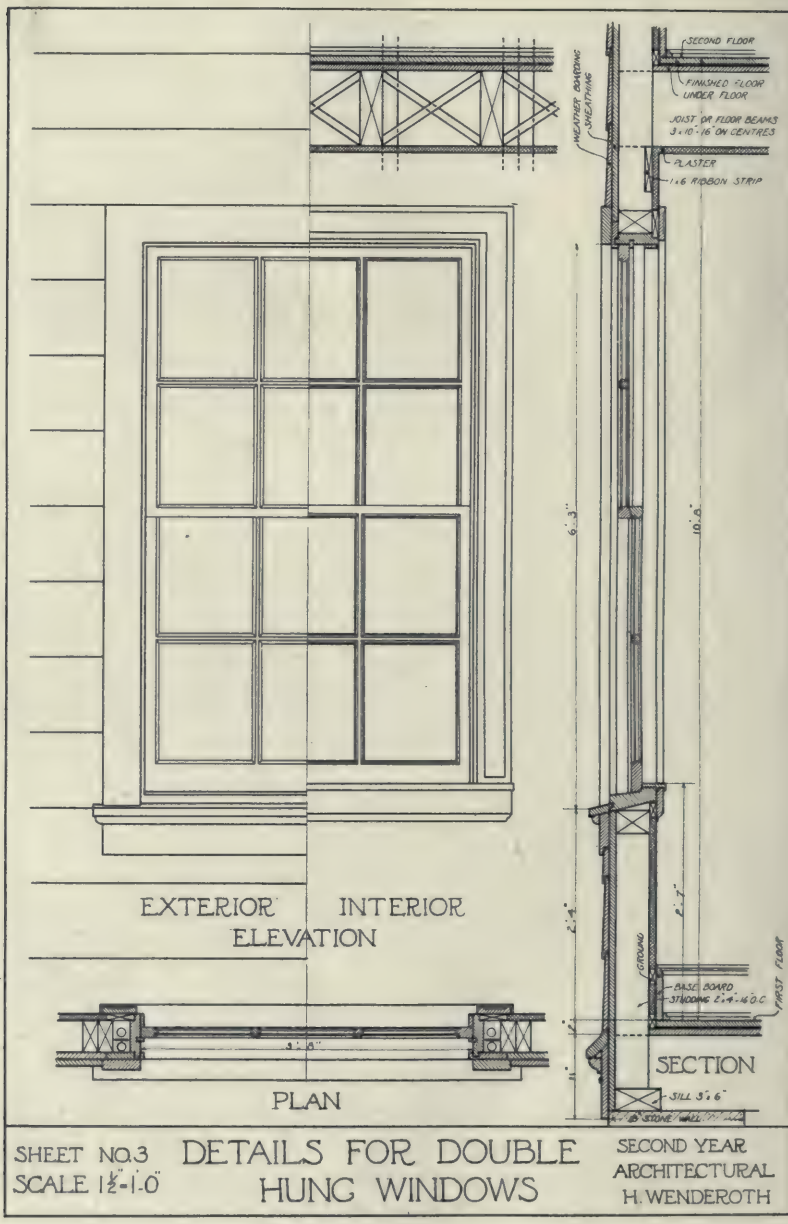


SKETCH OF CELLAR WINDOW AND WATER TABLE.

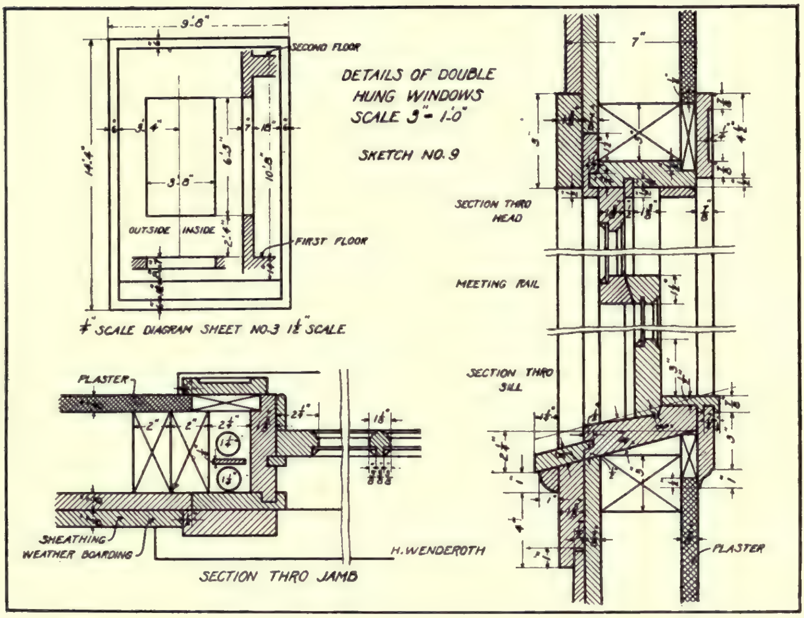
This sketch was drawn on the blackboard and its details noted by all the students. By means of the "layout" shown in the upper left hand corner of the sketch, and by the details given, the student was able to produce the drawing shown on the opposite page. It will be interesting to compare the technique of this sketch with that shown on Page 329 of the April, 1911, number.

stretched out, if need be, at full length on the broad tables in their efforts to forward on manilla paper these necessarily enlarged details for the mill-man or the contractor on the building. Certainly under such circumstances it can not be said that the Institute sends out its graduates unacquainted or unfamiliar with the requirements, the equipment, or the routine methods of modern office practice.

The drawings which have been selected to illustrate this article continue and complete the work of the second year course. They are, with one or two exceptions, taken from the portfolio of an artisan student and represent very fairly the standard of work which is reasonably expected and largely secured thruout the class. They show the


SECOND FLOOR
FINISHED FLOOR
UNDER FLOOR
JOIST OR FLOOR BEAMS 3 x 10" - 16" ON CENTRES
WEATHER BOARDING
SHEATHING
PLASTER
1 x 6 RIBBON STRIP
6' 3"
10' 8"
2' 4"
2' 7"
GROUND
BASE BOARD
STUDDING 2" x 4" - 16" O.C.
FIRST FLOOR
SECTION
SILL 3" x 6"
EXTERIOR
INTERIOR
ELEVATION
PLAN
SHEET NO. 3
SCALE 1½" - 1' 0"
DETAILS FOR DOUBLE HUNG WINDOWS
SECOND YEAR ARCHITECTURAL
H. WENDEROTH

attention which is given to a thoro understanding of the technique necessary to the proper rendering of drawings of different scale. Few students of constructive drawing outside of the practical field of the architects' office understand or can appreciate these requirements im-



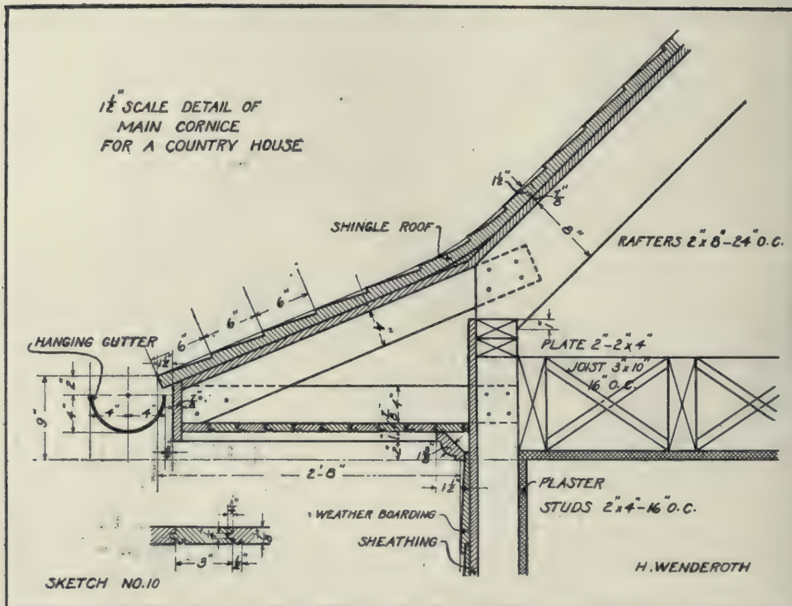
SKETCH OF DOUBLE HUNG WINDOW.

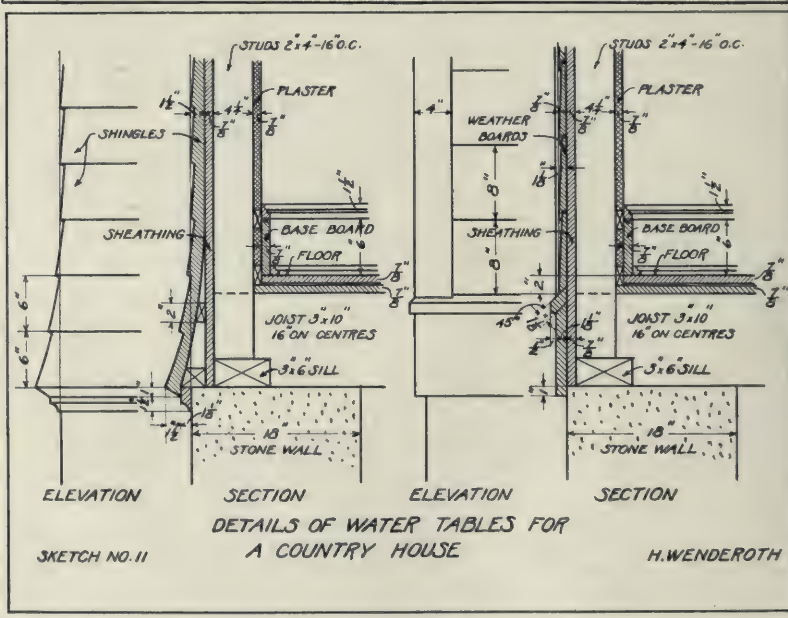
This sketch, like the one of the Cellar Window and Water Table on page 239, was carefully drawn from the blackboard by the students. Those interested will see in the "layout" how this data aided in the production and accomplishment of the drawing on the opposite page.

posed by the making of drawings in different scales. To make this point thoroly clear to the reader a special rendering of these comparative scales has been prepared and is shown on page 243.

A great deal depends upon the proper presentation of the classroom work if good drawings are to result in the somewhat limited time which the evening school year offers to the earnest student. It is a season during which no time should be wasted and at the same time it is vital that the work be so arranged that the instructors may give personal attention to the large number of men who enroll in these night classes.

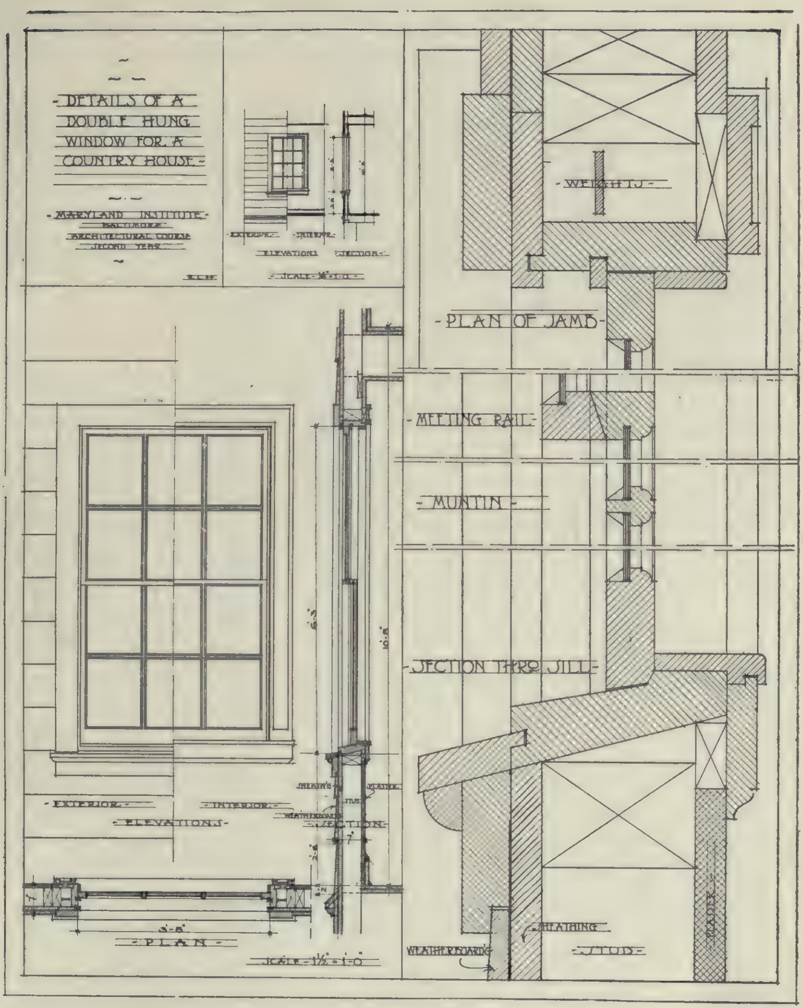
Much time is saved by placing upon the blackboard a well thought out "layout" for the details upon the sheet. Such a scheme is clearly





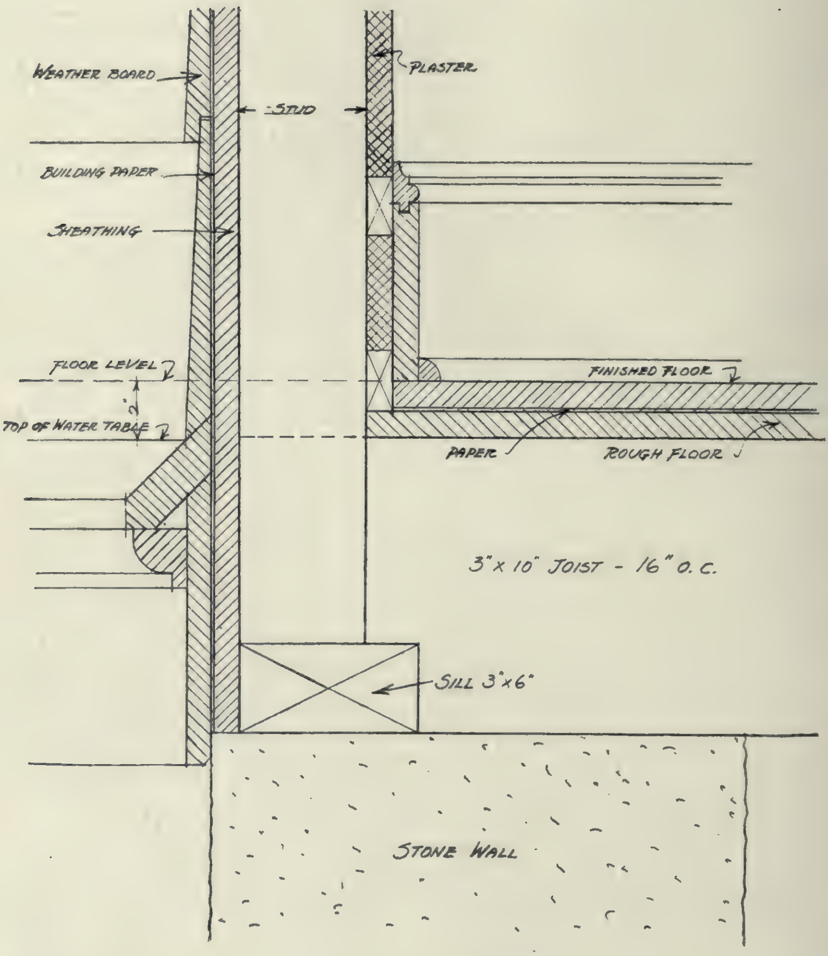
SCALE DETAILS (1½" SCALE) OF CORNICE AND WATER TABLES.

The detail of the Cornice should be compared in technique with that published on page 333 of the April, 1911, number. The details of the Water Tables are given with the purpose of suggesting other methods and arrangements from those shown on page 238.



COMPARATIVE TECHNIQUE OF SCALE DRAWINGS.

Few students of constructive drawing, outside those in the practical field of architects' offices understand or appreciate the different technique required for drawings of different scales. This is a point in which it is believed the Institute instruction is somewhat unique. This is best illustrated by this comparative diagram showing certain portions of a double hung window drawn first to ¼" scale, next to 1½" scale, and last full size. While the ¼" scale shown is here under such reduction that its details may not be perfectly clear, the method under which it is blocked out may be studied on page 331 of the April, 1911, number.



FULL SIZE DETAIL OF WATER TABLE FOR A COUNTRY HOUSE

SHEET No 5

ROBT. O. MILKER
2ND YEAR ARCHITECTURAL
1910 - 1911

FULL SIZE DETAIL.

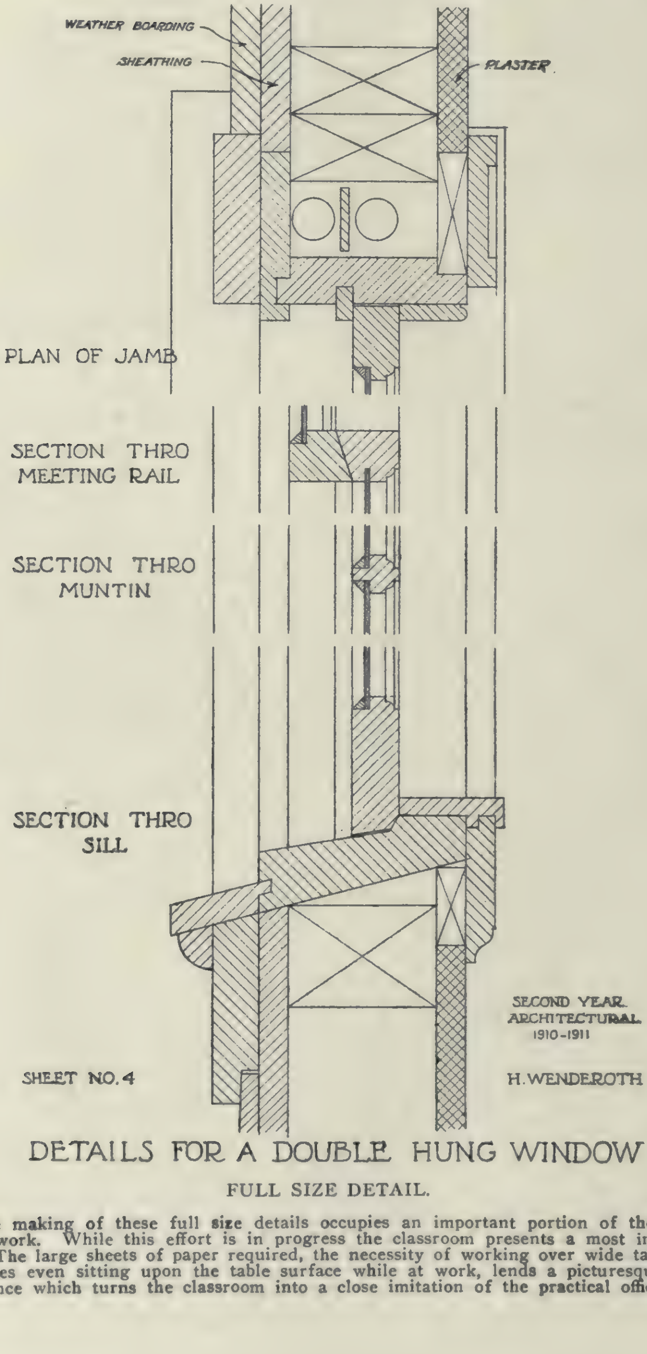
Detail drawings of which this and the one on page 246 are examples, are drawn full size on manilla paper for rough service on the buildings. By means of heavy black pencil and colored crayons very effective studies may be rapidlly turned out. The ability to make detail drawings of this sort is sure to lead the architectural student to profitable employment.

illustrated on the sketch of the cellar window and water table which appears on page 239. With this are offered all the details necessary for the accomplishment of the successful drawing. Most of the thought which must of necessity be expended upon more or less unfamiliar details has been accomplished by the time this sketch has been worked out in note-book form and the larger drawing to the 1½″ scale now undertaken, in its accuracy, neatness, and high technical character, is largely the result of this method of working. In itself it may seem to some teachers that to work up the note-book sheet in advance is time wasted. Such is not the case however, in the practical conduct of such night school classes.

It may not be amiss to add a word at this point concerning the methods of conducting this subject in the different classrooms of the four years' course. In each of the years the methods are much the same, and consist on the part of the instructors, of preparing an excellent blackboard drawing carefully worked out with T-square and triangles on the board in exactly the same manner and as far as possible to the same proportion which the students will later transfer to their sheets. The instructor then calls the pupils about the platform and in most friendly and informal fashion gives a talk upon the detail in question. He illustrates his work by actual pieces of full sized lumber, by discussions of the best and most practical as well as economical methods of construction, and shows wherever possible methods in use in different parts of the country for the construction of similar units of the buildings.

Naturally these informal talks bring out the thoughtful questions of the earnest students and these friendly discussions around the platform between instructor and pupils go far to make the spirit of the classroom more like a club with its social interests than what is ordinarily considered an educational classroom.

The students now gather about the platform to transfer by rather carefully made sketches that which has been studied upon the blackboard to the pages of their loose-leaf note-books. This affords a most valuable practice in freehand sketching, the power to accomplish which freely and well, can not help but be of great service to the artisan on the buildings. Those who are accustomed to building operations and whose pathways have led thru buildings in the progress of erection will recall the most excellent sketches which are frequently found on rough boarding and plaster walls and which serve as reminders of friendly discussions between foreman and workman over daily problems in building construction. The ability to thus freely illustrate what is most desirable

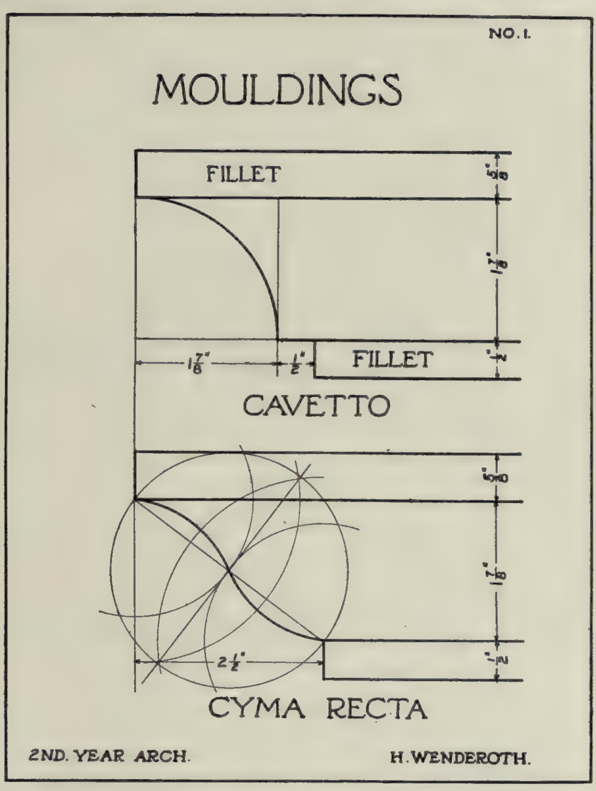


FULL SIZE DETAIL.

The making of these full size details occupies an important portion of the Second Year's work. While this effort is in progress the classroom presents a most interesting sight. The large sheets of paper required, the necessity of working over wide tables, and sometimes even sitting upon the table surface while at work, lends a picturesqueness of appearance which turns the classroom into a close imitation of the practical office.

in modern practice is something which we strive hard to cultivate and feel a reasonable pride in definitely accomplishing.

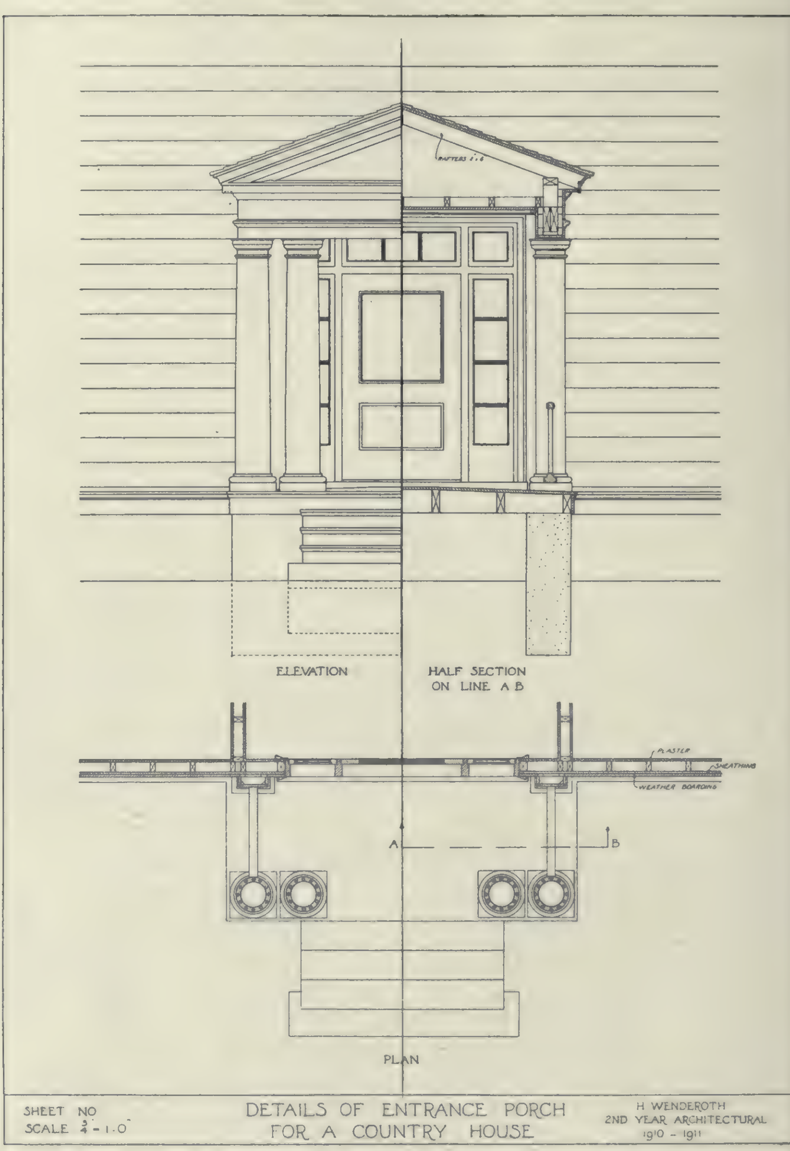
The serious study of the orders of architecture is a portion of the third year course rather than a part of the work of the second year



PROBLEMS OF MOULDINGS.

This sheet with its two examples should be read in conection with the Details of Porch on the next page, and with the other sheets of mouldings illustrated on pages 249, 250, and 251.

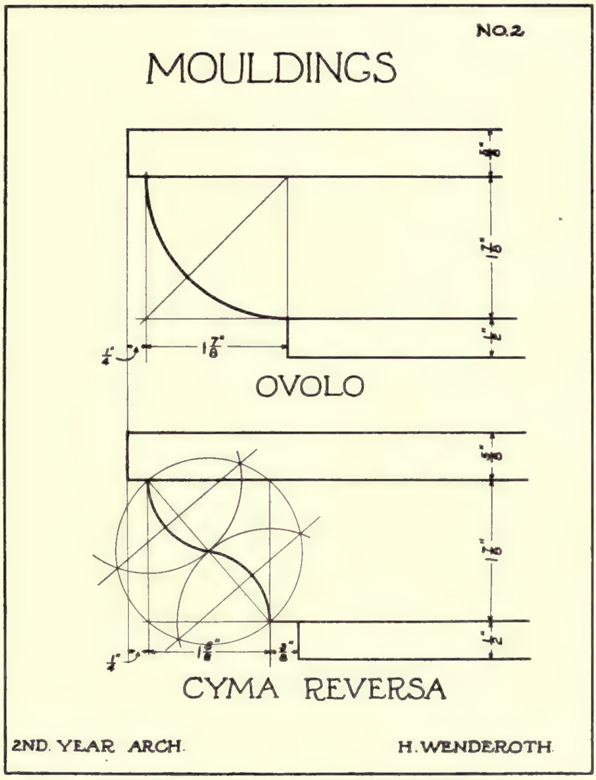
which we are here discussing and must, therefore, remain as a subject for later description and illustration. There are, however, a certain number of places in the detailing of the frame house in which sound, consistent knowledge of classic contours and proportions must be offered to the students of the class. Thruout the building both in interior and exterior finish, a number of mouldings are found which offer



DETAILS OF PORCH.

This detail sheet was one prepared for reference in the classroom by the students at the time they were engaged in the study of mouldings shown on pages 247, 249, 250, and 251. Such reference was planned to create the proper state of mind toward the study of the Orders of Architecture in the Third Year and also to make the study of mouldings a related and not an isolated subject.

most interesting opportunities for presenting the proportion, methods of drawing, and detailing of these classic curves by the ordinary practice of geometric problems. The students are, therefore, in this second year introduced to the classic orders which will follow by means of a practical rendering of these structural elements.

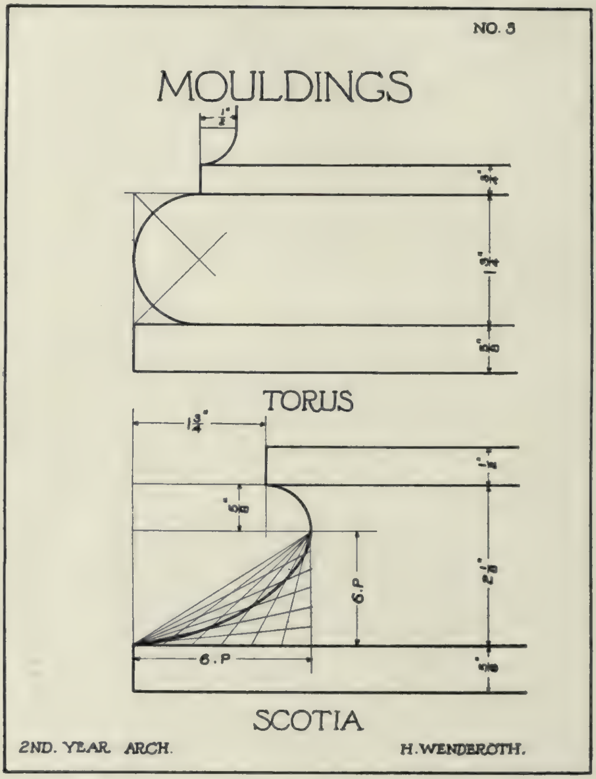


PROBLEMS OF MOULDINGS.

This sheet with its two examples should be read in connection with the references under the Details of Porch on page 248, and with the other sheets of mouldings illustrated on pages 247, 250, and 251.

Much of this work is brought out in the careful and consistent study of the porch (see page 248), to which constant reference is made thru the detailing of simple columns and mouldings to create a proper state of mind toward the third year study of the orders and also to make the study of mouldings a related and not an isolated subject.

All night school teachers will recall how many times students have enrolled in their classes with the hope of gaining special instruction in stairbuilding problems. This not only seems to be a most fascinating subject to the average artisan but one in which he is very quick to detect

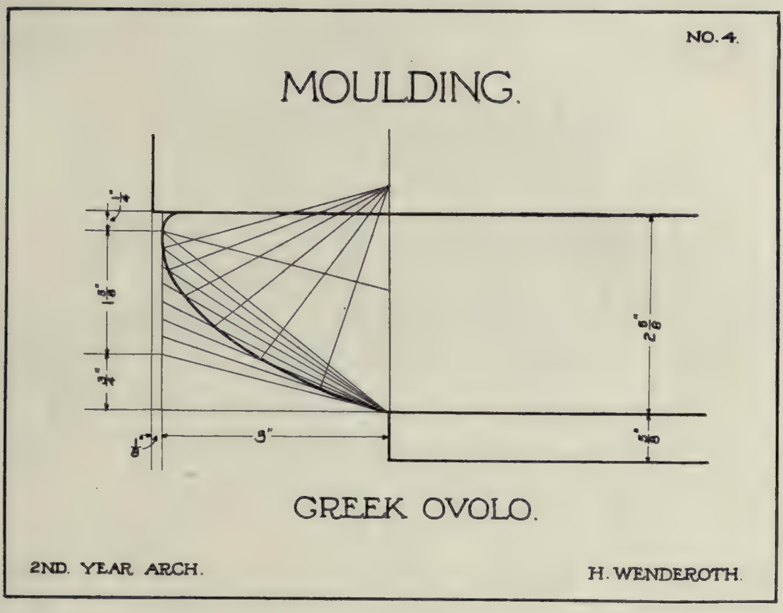


PROBLEMS OF MOULDINGS.

This sheet with its two examples should be read in connection with the Details of Porch on page 248, and with the other sheets of mouldings illustrated on pages 247, 249, and 251.

either the spirit of sincerity or the uncertainties which sometimes underlie a course in this subject. The stairway details which are illustrated on page 252 show only one type of stairway. Efforts are made in the classroom not only to illustrate this type but to undertake related problems in stairways which must be handled in more contracted areas and to suit the special problems of houses of different size and cost.

Comparatively few courses in building construction and details properly present those problems which offer themselves in chimney and fireplace construction. All houses must, to a greater or less extent, demand practical knowledge of these utilitarian details from the draftsman or the artisan. Usually the instructor contents himself with

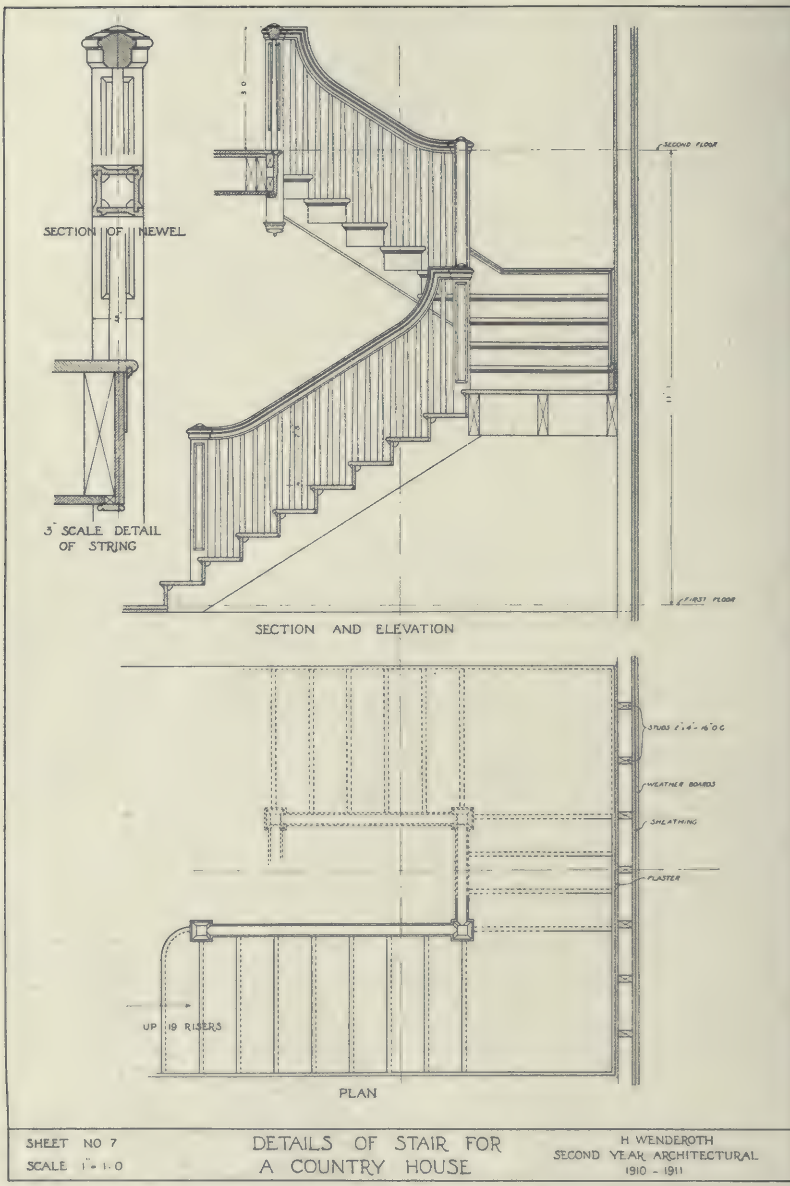


PROBLEM OF MOULDING.

This sheet should be read in connection with the notes under Details of Porch on page 248, and with the other sheets of mouldings illustrated on pages 247, 249, and 250.

drawing a fireplace, sometimes with mantel, and possibly a section thru the hearth, showing the general shape of the brick work at side and fireback. This, however, seldom answers the complete problem which the house under construction presents, for not only should the proper construction of the fireplaces be taught but practice should be offered in the proper arrangement of flues, right methods of disposing of the ashes, the framing and fire-proofing on floors, and the treatment of the roof problem where the chimney rises above the lines of the house.

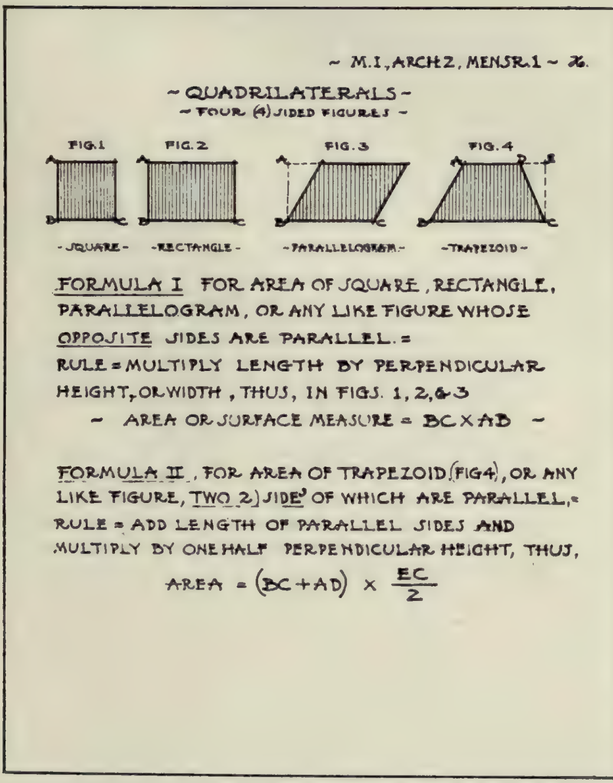
A most important part of the work of this second year is in the field of loose-leaf texts for building construction and mathematics. While a more extended statement concerning the course in mathematics follows



DETAILS OF STAIR.

The study of stairs is always an attractive one, and brings home to the student many important and valuable details. The reader will be interested to compare the technique of this drawing with that on page 341 of the April, 1911 number.

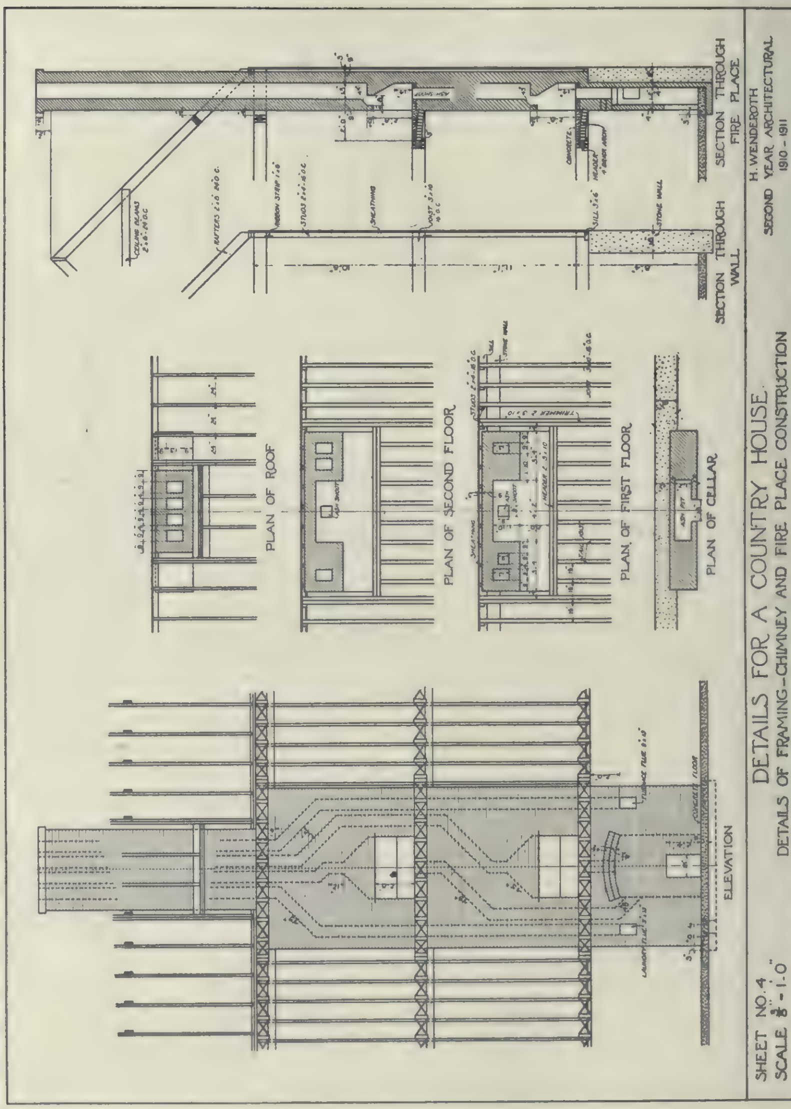
at the end of this article, yet it would not be fair to pass by this subject of texts without a recognition of the power developed by the thoughtful study of the printed page in connection with the careful details developed on the drawing board.



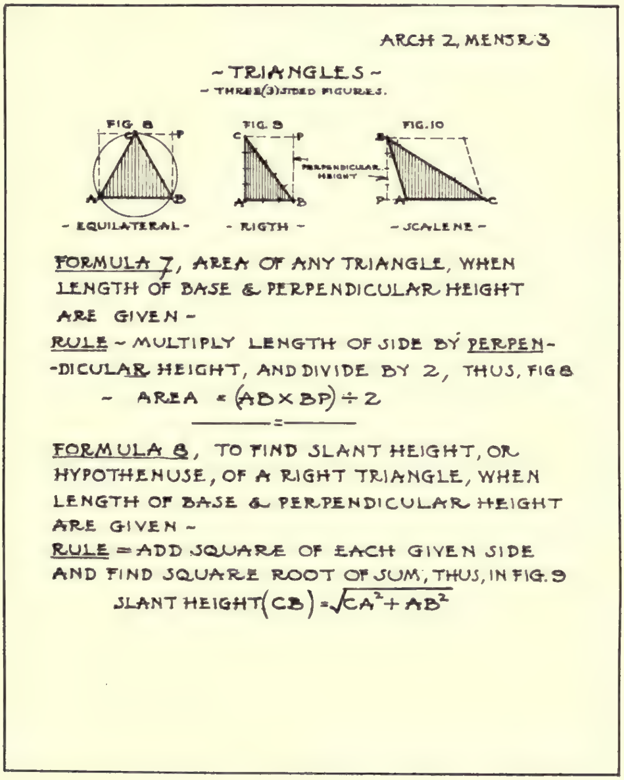
A SHEET IN MENSURATION.

Mensuration is undertaken as a part of the course in practical mathematics, and the accomplishment of this work is utilized as an additional study in lettering, spacing, and arrangement, as well as a means toward the solution of problems and the reading of formulas.

These texts are most carefully prepared by the instructors in the light of their own personal experience as practicing architects and with the knowledge born of long and successful teaching power. In this class the leaflets naturally treat of all details of carpenter's work, plastering, inside and outside finish, in fact starting the house by the digging of the cellar and continuing the story until grading is completed on the lot.


SECTION THROUGH FIRE PLACE
SECTION THROUGH WALL
PLAN OF ROOF
PLAN OF SECOND FLOOR
PLAN OF FIRST FLOOR
PLAN OF CELLAR
ELEVATION
SHEET NO. 4
DETAILS FOR A COUNTRY HOUSE
DETAILS OF FRAMING-CHIMNEY AND FIRE PLACE CONSTRUCTION
H. WENDEROTH
SECOND YEAR ARCHITECTURAL
1910 - 1911

The test of how far this work is pedagogically sound as well as practical has rested largely upon the work of certain women students of the class who are pursuing the subject from the standpoint of professions removed from actual constructive knowledge. That they have


ARCH 2, MENSR 3

~TRIANGLES~

– THREE (3) SIDED FIGURES.

FIG 8 FIG. 9 FIG. 10

– EQUILATERAL – – RIGTH – – SCALENE –

FORMULA 7, AREA OF ANY TRIANGLE, WHEN LENGTH OF BASE & PERPENDICULAR HEIGHT ARE GIVEN –

RULE – MULTIPLY LENGTH OF SIDE BY PERPENDICULAR HEIGHT, AND DIVIDE BY 2, THUS, FIG 8

– AREA = (AB × BP) ÷ 2

=

FORMULA 8, TO FIND SLANT HEIGHT, OR HYPOTHENUSE, OF A RIGHT TRIANGLE, WHEN LENGTH OF BASE & PERPENDICULAR HEIGHT ARE GIVEN –

RULE = ADD SQUARE OF EACH GIVEN SIDE AND FIND SQUARE ROOT OF SUM, THUS, IN FIG. 9

SLANT HEIGHT (CB) = $\sqrt{CA^2 + AB^2}$

A SHEET IN MENSURATION.

This reproduction should be read in connection with the notes under the illustration on page 253.

been able to keep their work fully abreast of the carpenters, masons, and plasterers working in the class and naturally thoroly familiar with all constructive methods speaks volumes for the sincerity and conscientiousness of the effort.

"Mathematics" may be a somewhat dignified term to give to the work in arithmetic and the application of elementary formulas which is carried forward in these architectural classes and parallels the similar work undertaken thruout the Institute night schools. As these courses

are wholly vocational in character and are planned to meet the needs of carpenters, bricklayers, stone masons, as well as workmen from related trades, the work outlined has to be most carefully arranged and presented. The courses are serious, searching, and helpful as far as they go and it is known that they develop a considerable amount of power.

It should be said that the night schools of the Institute stand on an absolutely elementary basis, are fitting schools in every sense of the word, and indicate no desire to grow superficially into a so-called higher institution. The Institute management recognizes that there are already a sufficient number of institutions of technology to adequately serve all sections of the United States. There are however, too few elementary schools planned to aid the artisan to develop the power to pick up the ordinary textbook and read it with profit without becoming discouraged over the first formula that is met. To produce this state of mind is what these courses undertake to accomplish in the field of "mathematics."

Of necessity this work is offered in the form of looseleaf texts, the preparation of which has been going on for sometime and which may, after careful trying and much thoughtful editing, develop into something that can properly be imprinted "Maryland."

From time to time the efforts of all instructors in these fields are checked by a supervising committee made up of practical men from the Board and faculty. It may be of interest, for the benefit of teachers endeavoring to solve similar problems, to note the ground outlined recently by this committee for the conduct of the present year's work in this subject.

It should be said at the outset that it is assumed the entering students have had such training that they are able to read and write ordinary combinations of figures and perform simple operations of addition, subtraction, multiplication, and division of whole numbers. In the several subjects of "mathematics" presented during the four-years' course, special emphasis is laid upon the fact that the instruction be offered in terms of practical problems in daily life in architectural pursuits rather than from the standpoint of pure theory. Only such subjects and problems are presented as are necessary to make clear the work of the particular year, or to pave the way for the projects of the following year. Statements of problems that are self evident or formulas that are in constant accepted service are given either as definitions or illustrated formulas and are not extended into fields of mathematical proof.

The first year in the architectural classes covers the addition, subtraction, multiplication, division, and other operations of fractions; cancellation; practice in the use of decimals, and problems in ratio and proportion. The time allowed during this year is from one-half to

SECOND YEAR CLASS IN ARCHITECTURAL DRAWING.

One (1) Hour Examination

March 30, 1910.

Name:- ELMER A. LENZ

Address:- 228 N. FREMONT AVE.

<u>Instructions</u>.

(1) Fill in above blanks.

(2) Drawings referred to in questions are shown on sheet at left of platform. <u>Freehand</u> sketch of same, at about 1/8 inch scale, to be made on next sheet.

(3) All work necessary to solve questions <u>must</u> be shown in <u>detail</u> on accompanying sheets and numbered in accordance with questions.

(4) All work <u>must</u> be done in 1/8 inch printed figures and lettering.

(5) Carry all solutions to two (2) decimal places <u>only</u>.

<u>Questions</u>.

(1) Find number of cubic feet of earth which must be removed in order to make the cellar 8 feet deep.

(2) (a) Find length of rafter "A" Answer one question only.
" " " " "B"

(3) Estimate cost of applying stucco to walls, including gables (not roof) at $1.10 per square yard.

(4) It is proposed to install in the house a cistern (cylindrical) 6 feet in diameter and 8 feet high. Find number of gallons of water it will hold, allowing .1337 cubic feet to a gallon.

(5) Estimate cost of house at 12.5 cents per cubic foot.

A SAMPLE PAPER FROM ONE OF THE MANY SHORT TESTS.

Tests and examinations are held from time to time during each year and are followed by opportunities for friendly discussion and explanation. These tests do much to sustain the interest in the work.

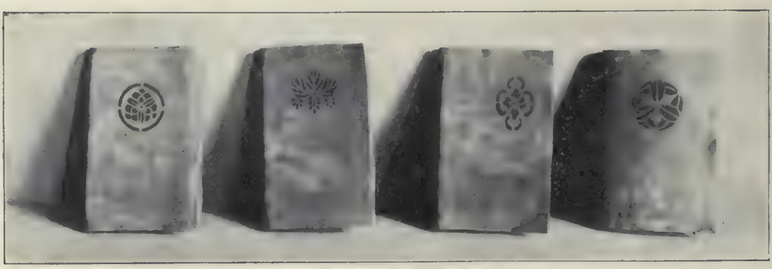
three-quarters of an hour per week, as most of the time must of necessity be given to work upon the drawing-boards.

The second year work in this field deals with the rudiments of plain geometry including the measurements of surfaces and solids, the subject of roots and the use of formulas in letters, while the time allowed is the same as that for the first year.

As the course advances into the third year, and the training and maturity of the students warrant more thoughtful effort is given to problems dealing with measures and weights, stresses and strains, under a program which allows the assignment of one hour per week to these subjects. As these classes meet Monday, Wednesday, and Friday evenings, from 7:30 to 9:30 and the session extends from the first week in October to the last week in March it will be seen that a considerable amount of conscientious effort is possible.

During the fourth year the problems in these architectural classes hold a very decided interest as the assignments are those dealing with the application of mechanics to the loads in the buildings under way upon the drawing-boards. The work in this year utilizes at least one hour a week and frequently extends over this allotted time.

To state the matter briefly, we are endeavoring, as is the case with almost every night school of serious vocational interest, so to solve the problems presented by the "mathematical courses" that the work offered will not frighten away the workmen who come to us for insight into drawing and their making and reading. While following this common ground we intend at the same time to shape our work so seriously that we may perchance, as has happened many times, create the desire upon the part of our graduates to go on to higher institutions; entering, for instance, the University of Pennsylvania, Lehigh, or the Massachusetts Institute of Technology, and there receive commendation and sometimes credit for the sound and sincere work accomplished.



RESULTS OF A BOOKMAKING PROBLEM, BRADLEY INSTITUTE.

EDITORIAL

ANY scheme of manual arts must give full consideration to the needs of the rural high schools. These schools far out-number those located in cities; for example 82 per cent. of the total number of high schools in the State of New York are located in villages having a population of less than 5,000. Boys and girls of the open country are entitled to the same benefits which accrue from instruction in the manual arts as city children.

Manual Training in Rural High Schools

The rural schools must find means for the presentation of handwork from the agricultural standpoint. It is a mistake to extend to these schools the same industrial work which is practical and desirable in the city schools. It may be better for a farmer's boy to learn how to set a pane of glass in a hen house than to make a clothes-rack.

In some respects the teaching of the mechanical arts in a rural school can be more practical in its presentation than that given in city schools where many children are unfamiliar with the actual applications of industry and frequently spend their time outside of school hours apart from any real contact with industrial processes about which they are studying. A few suggestions might be in order bearing in mind that the work under discussion calls for a different equipment, proceeds from a rather different viewpoint, and is inspired by a much more concrete and definite purpose than obtains in general manual training work.

A word with reference to equipment. While many high schools have been built without reference to the introduction of manual arts, it is true that rooms not already suitable for the purpose may often be made so at small expense. Let the older boys do some of this fitting up. Possibly additional windows will be needed in the basement. Let the boys knock out some of the bricks and make window casings to fit regulation sashes. If there is no concrete floor, the cement for making it can be mixed, tested and laid under the direction of the teacher (perhaps assisted by some local expert), as a regular exercise of the course in mechanic arts. If the building has a gasoline engine or electric motor for ventilation, arrangements can often be made for extending its shaft or a counter shaft into the shop room, to be used for turning

a grindstone, blowing the forge, or running a drill-press or wood lathe. A continuous bench might be built by the boys. At the end nearest the forge and anvil there might be located one blacksmith's iron vise, and nearby a blacksmith's drill-press. A good grindstone, mounted by the students, could be placed in a convenient corner, and vertical cabinets for the tools belonging to the school could be built by the first class from their own designs. Some open space should be reserved in the middle of the room for the use of sawhorses, for setting up work in course of construction, and for testing the operation of gasoline engines. Later on as the work grows, a shop could be built, detached from the school building, but near enough to it to be heated by the same system. Such a building could be designed, drawn, and largely constructed by the labor of the class. It would give an excellent opportunity for making and laying concrete blocks or solid cement walls, patent roofing, tiles, cellular tile blocks, and other forms of modern building material that are very useful on the farm.

Course of Study in Rural High Schools

A word with reference to the course of study. It is unlimited in its possibilities. All sorts of helpful suggestions are published under the heads of "Handy Farm Devises;" "Modern Blacksmithing;" "Farm Blacksmithing;" "Physics of Agriculture;" and "Farmers' Bulletins." Teachers should be sure that the students know how to sharpen tools, set and file saws, and make a chest for keeping tools in on the home farm. One of the most useful bits of skill often used in an emergency is the ability to make quick repairs in harness. To assist in the development of such ability, the farm mechanics class could make for permanent use in the school shop one of the harness clamps or vices that are designed for this purpose. Pieces of broken harness might be brought from home to the shop, and the ingenuity of the class exercised in devising and executing the best methods of quick home repair.

Special assistance can often be obtained from the Department of Farm Mechanics of the State University or Agricultrual College. Local instructors should not hesitate to secure assistance from local experts who may have unlimited knowledge in the practical work involved on certain topics. It is a distinct advantage to the class and to the course in enlisting the favorable interest of a large number of school patrons, by securing assistance if possible from well informed practical mechanics and farmers. Not every teacher of manual arts can do

brazing, setting up a bit of plumbing, weld iron and steel, design a homemade forge, build a pattern, mend a harness, make a rope halter, mix concrete, or babbitt a bearing. But this is a sort of work which is going to be expected of his students when they get to work. While the instructor should never pose as one who always knows the ultimate facts on any topic, he should frankly acknowledge efficient assistance received from others, he should aim to know more of the science and literature of the subject, and, if possible, of its practical applications than could be expected of anyone else in the community.

A few of the many topics which will give students the ability to use, adjust and repair the various tools, implements and machinery required in modern farm operations, and to direct, if not actually to perform ordinary constructive work in improving farm buildings, grounds, and home conveniences follow:

Apple sorting table, babbitting, barrel header, butter worker, chicken coops, cold frames, portable forges, harness clamps, lifting-jacks, potato sorter, repairing sickle bar, model stairs, stoneboat, trap nests, wire tightener. —ARTHUR D. DEAN.

Zeal Without Knowledge Our English correspondent, H. Williams Smith, sends us a new year's wish for manual training teachers which contains one phrase in particular that fits American needs at the present time. He implores the good Lord to deliver us "from zeal without knowledge, and undue haste." There are times when it may be counted a virtue to undertake a task for the accomplishment of which one has had no specific preparation. Occasionally a man becomes a hero by espousing a great cause and then laboring for it blindly. But while one hero is produced in this way the chances are that a score of fanatics have been let loose upon the world. There is no royal road in fitting oneself to become a successfull teacher of manual training, but it is certain that just as measurable knowledge and skill are necessary to teach manual training as arithmetic or Latin grammar. So many bad habits are being formed by misguided or unguided pupils that it is high time that knowledge as well as zeal be counted an essential prerequisite in the teacher who is to be the example and guide in manual training work. Too often we have heard teachers make such statements as these: "No, I have not taught manual training, but I can. My father was a wheelwright and I was brought up in the shop." "Yes, I suppose one ought to have more experience in tool work, but I have taught school so

long that I can take up almost any new subject readily." "I don't want to do the work with my own hands. All I want you to do is to tell me how to do it so that I can tell the children." What lack of appreciation of the fundamentals in manual training! Certainly no one is fit to guide children in forming habits of thinking and doing thorough manual training until he is skilful in the use of the tools with which the children are to work, has made an analytical study of the technical processes involved, can elucidate the scientific and mathematical principles involved in the forms and uses of the tools and in the materials worked, and has some appreciation of just what changes manual training ought to produce in children and how this can be done. Let us have zeal, but let us have knowledge also. —C. A. BENNETT.

Another paragraph from our English friend further emphasizes this point:

Education versus Utility

Some weeks since we had occasion to warn teachers of the possible evil effect of allowing humanitarian considerations to push themselves *too* far into professional work. The warm-hearted and sympathetic teacher is very susceptible to the discomforts and privations of his pupils, and we rejoice it is so. This has induced him to organize and carry on feeding centres, institute and manage boot clubs, and generally to try in any and every way to mitigate the miseries of neglected childhood. With what result? An attempt to convert voluntary effort into official and professional responsibility. The attempt failed, but it carried with it a warning we would emphasize. That warning, however, had reference to a possible increase of the professional burden. We wish now to draw attention to another and wider aspect of the same question: the extent to which over-zeal on the humanitarian side may lead some to do injury—unconsciously, of course—to education itself. A certain school, situated in a poor district, is attended by children who suffer very considerably from being ill-shod. By the way, it is not by any means the only school whose pupils suffer thus. The head master is quite naturally filled with concern, and wishes to help. Now we do not hesitate to say that he could help in many ways as hundreds of teachers have done, are still doing, and will continue to do. But rumor has it that to meet the need he is contemplating the formation of a "cobbling" class as part of the actual school work. In all friendliness we suggest that this is not the proper way to meet the difficulty. There are many and serious objections to "cobbling" as an occupation for boys in school, and these altogether apart from the one we now urge. It is this: The subjects of the school curriculum must be chosen for their value as instruments of education, and not for the purpose of supplying or repairing useful articles, however crying the need. Do not mistake us; we recognize to the full the value of manual training as an essential factor in education, but we wish it to retain its function as such. We also recognize that the manipulation of leather may be a very desirable form

of manual training. It is, however, as uneducational to arrange manual training in leather for the purpose of mending boots as it would be to arrange manual training in wood-work for the purpose of repairing school furniture. We hope rumor is ill-founded in this case, and that education will not be hampered by such a proposal.—H. Williams Smith in the London *Schoolmaster*.

Living vs Preparing for Life

The essential element in elementary school subjects is that which relates them to the experience of the child. And this is the point in school life about which the real interest of the child centers, and which will call forth his greatest effort. One has but to follow the average child through the elementary schools to realize the truth of this assertion. In the kindergarten and first grade almost without exception the child is happy, eager and responsive and his interest is intense. By the time the third grade is reached, and thereafter, all this is changed. Vital interest is gone. The child meets the tasks of school life largely under compulsion, or from a sense of duty. In the early years, school work deals almost wholly with actual life experiences. In the later years it deals with abstractions, unrelated to experience. The early work deals with the concrete, the present, with actual living; the later almost wholly with the abstract, the remote, with preparing for life. The genuine appeal of the public school is to the few who naturally express themselves abstractly, rather than to the many who express themselves in action, or about activities.

The elements which make for efficiency in life are those which find expression in activity. Wherein then, is the inconsistency in utilizing activity throughout the school life of the child? If school courses as they exist meet the needs of the few, assuming, if we wish, that pure abstractions are the best educational means for those who can master them, why should there not be parallel courses to meet the needs of the many? In the vast field of activities available for use in the schools almost every essential of the elementary school curriculum can find living expression, almost every principle can find illustration in actual experience. And where activities have been utilized to the fullest extent possible it has been shown beyond a doubt that enthusiasm, spontaneity, interest, purpose, and independence of thought and action have developed, even in those who had lost all interest in school life.

Hand expression justly claims a larger place in the elementary schools, with industry, the great civilizing, socializing and cultural influence of society as its basis. —W. E. Roberts.

Parochial School Children Want Manual Training

A court decision of interest to manual training teachers and school people generally has recently been handed down concerning the new school code in Pennsylvania. In the city of Altoona some pupils of the St. John's parish school applied at the public school in their ward for instruction in manual training. They were refused admission because they did not wish to take all the school studies of the course, but merely the manual training. One boy was selected for a test case and the matter was thus brought into the courts. On the 29th of December, Judge Shull of the district court gave a decision which allows the boy to take manual training in the public school while pursuing all his other studies in the parochial school.

This same question has come up in other states and has we believe been settled without taking the question into the courts. For instance the city of Grand Rapids, Michigan, gives manual training instruction to about four hundred pupils from parochial schools. In Springfield, Illinois, parochial school children are admitted to public school manual training classes. This question has come up also in Iowa and Massachusetts. To us there seems to be no question as to the justice of the Pennsylvania decision, but we can readily see that if every boy in attendance at private and church schools were to ask for admission to manual training and other special classes in public schools the school boards would have a complex and uncertain problem to solve.

ASSOCIATIONS

HIGH SCHOOL CONFERENCE.

The meeting of the Manual Arts Section of the 8th Annual High School Conference was held in the Wood Shop Lecture Room of the University of Illinois, November 24th, 1911, with Assistant Dean W. T. Bawden presiding.

The first speaker was Clarence Bonnell, of the Harrisburg Township High School, who confined his remarks to the work outlined in Group 1, which is a review of the grammar school work in the fundamental tool processes. Emphasis was placed upon the value of a clear conception of the process of doing the work, rather than upon the completed project, as the skill will come later. Attention was directed to the inaccuracy of the students entering high school and this was well illustrated by means of a number of paper squares which were supposed to be cut to a definite size. The inaccuracy, which could readily be observed, showed one of the problems which confronts the teacher in manual training. The pupils should be kept on this first group until they gain the necessary skill in using tools. Pencil sketches are valuable and the elementary principles of drawing can be taught by means of the game board, which will serve as an illustration and also be something useful to the pupil. Accuracy is insisted upon. As an example of a method of securing this, an exercise was shown, consisting of two half joints cut to dimensions in the same piece of stock. There is no opportunity to cut and try and when both half joints are finished the piece is cut in two and the halves should fit. Another method of securing accuracy is by team work, in which each pupil is assigned a part of some object like a book rack, containing 12 halved joints, and then the whole is assembled after all pieces have been completed. For examination work, a method of grading is used whereby a certain number of points are deducted for various inaccuracies; for example, $\frac{1}{16}$ inch off from dimensions, deduct 5%. Similarly, a certain per cent. is deducted for irregular surface, chips, etc. This method will place the pupils on an equal basis and afford a direct method of comparison.

The discussion of the "fundamental processes" was continued by A. P. Laughlin, of the Peoria High School, who stated that there is some difficulty in adjusting a review to a mixed class; but it is necessary to know that the pupil can do the work required regardless of the previous training he may have had. The speaker allows a month for the exercises with a plane and six weeks for the whole review work, which must be done, if the pupils have to put in overtime to do it. The first lesson is on the plane, which is followed by instruction in gaging and the use of the knife line. In connection with boring holes, an outline of the history of the various methods of making holes is given, supplemented by catalog cuts, etc. Accuracy is insisted upon and one method of securing this, as well as testing the work of the pupil, is to require him to make a one-inch square hole in a board, which is handed in to the instructor. Then the student makes a plug to fit, and after both are completed they are assembled

and a grade is given according to the results. After the completion of the preliminary work, and the pupils have shown that they are capable of doing the work, they are permitted to make Christmas presents.

The construction of the mortise-and-tenon joint was discussed by George A. Todd, of the Kankakee High School. Emphasis was placed upon the proportion and strength of the tenon. The pupils should study the joint so as to proportion it to the best possible size. If the pupil realizes that the tenon should fit just as well inside the mortise and be as smooth and perfect as it is on the outside there will be no difficulty with glued joints.

The discussion was continued by A. C. Newell, director of manual training, Illinois State Normal University, who did not favor the use of exercises, but would rather have the student make something which is useful. In laying out work a fine pencil is used and the knife line is drawn later to avoid cutting too far with the knife, as beginners are quite likely to do. In order to keep the class together at the start pupils are not permitted to build large articles, as it is difficult to bring a class together after it has once separated on individual work. An outline was presented such as is used in the work and is strictly followed. Freehand sketches are used and the pupil trained to work up designs for himself. As an example, in making the end of a book rack a large number of paper designs will be cut out by the pupils and the best will be selected for use. After the tool work is all finished and accepted the pupil may scrape and sandpaper the article and give it a suitable finish.

In the discussion which followed the question was raised as to whether the conference outline permits the use of sandpaper and the opinion seemed to prevail that it may be used after the tool work is completed, but not before. A very interesting general discussion followed, relating to the different methods of sawing, planing, and the use of various tools.

The discussion was followed by an address by Professor Lotus D. Coffman, lecturer on education, Charleston, Illinois State Normal School, who presented a very carefully prepared paper on the "Sanctions of the Manual Arts." Going back to the beginning, he showed that at first the manual arts did not appeal to popular opinion until after a long period of private support. Then, after many years, legislation was enacted which made it permissable to teach the manual arts in the schools. The teachers, as a class, held out against it and objected on the ground that the study of manual arts is not cultural, tho it might have a practical value. A foothold was first gained in the large eastern cities and it gradually spread to the smaller cities and to the rural districts. Similarly, the work begun in the east gradually spread westward. At last, an awakened public opinion forced the school people to recognize the value of the manual arts, but they did so on the ground that it has a great mental training value, thus showing a complete reversal of feeling toward the subject. The history of education shows that while the extension of the curriculum has been made in a few instances by some individual teachers the important changes have never been brought about thru the activities of the teachers as a class, but thru outside influences.—P. J. Freeman, in Charge of Mechanical Department Shops, University of Illinois.

EXERCISE MODELS VERSUS USEFUL MODELS.

In a paper read before the Manual Arts Section of the Minnesota Educational Association, October 26, 1911, on this subject, Thomas S. Armstrong, director of manual training in the Crookston, Minnesota, public schools, said: "Tell me how anyone can acquire good judgment from a set of definite exercises all alike as to purpose and requirements, that lack beauty, symmetry, proportion, and the power of developing imagination, that which has made manual training what it is to-day. Where in a set of joint exercises can a boy learn the correct thickness of the tenon in proportion to mortise sides? Where can he learn symmetry, proportion, beauty of curves, and pleasing lines? Where can he learn to use that reasoning power we lay so much stress on in mathematics and science?

"You may ask, what good does it do a boy to make a necktie-rack with a back of some geometrical outline? None whatever, if he is given a blueprint with the outline laid out for him; but if he is shown a print of a necktie-rack and you say, 'There are the general dimensions, and this rack is pretty; but let us see if you cannot design one of a different outline.' I have had a boy work two or three days on the outline of some simple model and thought the time well spent. It was hard for him, but, mind you, the next time it was easier, and each time he had similar work to do he grew and developed so that when he came to the designing of furniture and cabinets he did not want to copy, for nothing would suit him but his own designs.

"It is impossible to develop this self-reliance under a purely mechanical model system. The boys are not thrown upon their own resources; they are not given a chance to use their own judgment. They are held down and made to follow in a set groove, the end of which is to pass a good examination.

"Superintendent R. B. McLean, in his paper on 'Manual Training in the Grammar Grades,' said, 'The instructor in manual training who in order to give to his students an opportunity to acquire technic, outlines an inflexible course, largely of exercises, but so arranged as to bring in the proper tool processes, is apt to find his work a failure. Such an instructor forgets that boys are great imitators and are anxious to make useful things as they have seen the mechanics of their acquaintance do. Not that the pupils should be allowed to make what they please, but that the instructor should take advantage of the interest of the pupils in the construction of real things to make the work easier The piece that will receive the pupil's closest attention and most diligent effort is the piece that becomes his own property and serves some useful purpose.'

"Now, of course, there are objections to this if you look at it from a purely technical standpoint, for we know it is almost impossible to work into any course of useful models many of the joints which may come up in the technical world. But I hold that it does not make one bit of difference whether a boy when he finishes a grade knows five different kinds of joints or not. I care not if he has not learned to make but one, if he has learned to like school, if he has awakened to the fact that he can do things, that he has acquired a taste for knowledge and work and craves for more. Let the other departments make it their business, if you so will, to give him the foundation of learning, but let the manual training department be a source of joy, let it give him that which he wants in the

way of a pleasant occupation. ......We have come to realize the fact that we can make the subject not only instructive but also practical and a source of pleasure from the start."

OHIO ART AND MANUAL TRAINING ASSOCIATION.

The Ohio Art and Manual Training Association, held its annual meeting on November 10, 1911, in Woodward High School, Cincinnati. Assistant Principal, Pliny A. Johnston, of the Woodward High School, President of the Association, delivered an address at the opening of the morning session. Mr. Johnston spoke of the recent meeting of the National Society for the Promotion of Industrial Education and called the attention of the members of the Association to the value of this meeting and the changes that were taking place in industrial education in the country. He also spoke of the work of the Woodward High School, more especially of the industrial courses and the plans that are being carried out for making the third and fourth years of the industrial course cooperative in their nature.

The Woodward High School male quartette delighted the Association with several excellent numbers.

Fred C. Whitcomb, Miami University, Oxford, presented a paper on the "State Course of Study in Manual Training." At the May meeting of the Southwestern Ohio Manual Training Teachers' Round Table, a committee which had previously been appointed reported a course of study in manual training as suggestive for the schools of the state. This report was ordered printed and presented to the state Association at this time. In this paper, emphasis was laid on the importance of every teacher of manual training having in mind a definite aim for his work. As a suitable aim, industrial intelligence and appreciation leading to industrial adaptability and efficiency was suggested. The suggestion was made that the name "industrial arts" seems to represent more fully the kind of work that we are doing and should do, than "manual training" which had in mind the work at the time when formal discipline held a large place in the school systems of the country. The aim for all educational work as well as for the industrial arts is found in the social organism. The method of approach in teaching the constructive work of the school is thru a study of typical industries; tool processes, sequence of exercises are mere incidental factors in the larger problems of the study of industries. The report on the state course of study was received with favor by the Association and it will receive further consideration at future meetings of the Association.

At the afternoon session, an interesting talk was made by William H. Vogel, supervisor of drawing in the Cincinnati schools, on "Public School Art." This was followed by a paper by Arthur C. Jones, teacher of drawing in the Woodward High School. His subject was, "How to Make Art of Some Use to Girls." He is doing some excellent work in drawing in connection with the domestic art and domestic science work of the high school.

Frank H. Ball, supervisor of manual training, Cincinnati, and J. D. Lambert, supervisor of manual training, Dayton, presented the subject, "Lions in the Way." In their opinion, most of the lions could be overcome by strong determination on the part of the teacher and most earnest efforts on his part.

The following officers for the ensuing year were elected: President, Thomas K. Lewis, Ohio State University, Columbus; Vice-President, Nellie B. Noble, Miami University, Oxford; Secretary and Treasurer, Howard Carter, supervisor of manual training, public schools, Hamilton; Chairman of Executive Committee, Anna Bier, instructor in drawing, public school, Greenville.

The Association adjourned to meet at the call of the Executive Committee.

—F. C. WHITCOMB.

INDIANA STATE TEACHERS' ASSOCIATION.

The Manual Arts Section of the Indiana State Teachers Association had an especially strong program at the meeting in Indianapolis during the holidays. The first speaker was John L. Ketcham who pointed out what teachers can do to aid industrial education. He was followed by Professor Frank M. Leavitt of the University of Chicago, who discussed the relation of manual training to industrial education. "Trade Schools" was the subject of an address by Ex-Mayor Charles A. Bookwalter of Indianapolis. Superintendent William A. Wirt of Gary, whose school work is attracting much attention, told how to secure funds and school time for manual training. The question, "Does Indiana Need Vocational Training?" was answered by Hon. Will A. Yarling of Shelbyville. The program closed with the supervisor's view point by H. M. Appleman of South Bend. On the whole it was a meeting of exceptional richness of ideas.

INDUSTRIAL SCIENCE AND ARTS ASSOCIATION.

At the last meeting of the Industrial Science and Arts Association, Grand Rapids, Michigan, the officers for the year were elected and several new members voted in. Two Committees were appointed by the Association; one, for the investigation of what is being done in Vocational and Continuation school work in Michigan, composed of F. L. Hann, Muskegon, Walter Wheater, Kalamazoo, and Louis Gunther, Grand Rapids; and the other to make recommendations concerning the unification of drawing and shopwork courses, composed of Fred S. Huff, Kalamazoo, E. D. Silver, Muskegon, and M. W. Shillinger, Grand Rapids. Interesting developments are expected in the course of the year.

INLAND EMPIRE TEACHERS' ASSOCIATION.

The manual arts teachers of the Inland Empire Teachers' Association, at the last meeting in April, 1911, organized a manual arts section of the association. Officers were elected and a committee appointed to take charge of the work of perfecting the organization and providing a program for the meeting to be held April 3 to 6, 1912.

Clarence A. Steelsmith, of Lewiston, Idaho, was elected president and Miss Anna M. Rodgers, of Spokane, Washington, secretary. The program and organizing committee, in addition to these officers, has three members; Miss Nellie Powers, Spokane, C. F. Miller, Spokane, and R. E. Cloupek, Baker, Oregon.

A constitution and by-laws will be presented to the section for adoption at the coming meeting, thus securing, it is hoped, a permanent organization.

AMERICAN HOME ECONOMICS ASSOCIATION.

The American Home Economics Association held its fourth annual convention at Washington, D. C., December 27-30, at the same time as the meetings of the American Association for the Advancement of Science. The address of welcome was delivered by Philander P. Claxton, the U. S. Commissioner of Education, who discussed the theme of "Education and Home Economics."

During the convention many valuable papers were read and round table discussions held on the topics of applied science, domestic art instruction for colleges, elementary work in preparation of food in college classes, school lunch rooms, and extension work in home economics.

ILLINOIS MANUAL ARTS ASSOCIATION.

The ninth Annual Meeting of the Illinois Manual Arts Association will be held at Bradley Polytechnic Intsitute on February 16 and 17, 1912. The general topic for the meeting is "Vocational Education."

Visits to the public schools of Peoria and to Bradley Institute have been arranged for the early part of Friday, and at 2:30 o'clock in the afternoon the first session will be held at the Manual Training High School. At this time the report of the Committee on "Courses of Study in Manual and Industrial Arts" will be presented and discussed. "To What Extent shall Vocational Education Influence Courses of Study in the Manual Arts?" will be discussed by George H. Jensen, St. Louis; and "Courses of Study" by Albert S. Bauersfeld, Lane Technical High School, Chicago, and Iri S. Griffith, Oak Park.

At 6:00 o'clock the annual banquet will be served at Bradley Institute, Vice-President A. C. Duncan, Quincy, presiding. The principal address of the evening will be made by Judge R. A. Russell, Superintendent of the Illinois State Reformatory, Pontiac. There will be addresses also by the President and Vice-President.

The Saturday morning session will be held at Bradley Institute at 9:00 o'clock, with the following program: "Prevocational Work as Prevention for Juvenile Delinquency," W. H. Henderson, Springfield; "The Elementary Technical School, Evanston," W. W. Pettit; round table discussion on "Vocational Education."

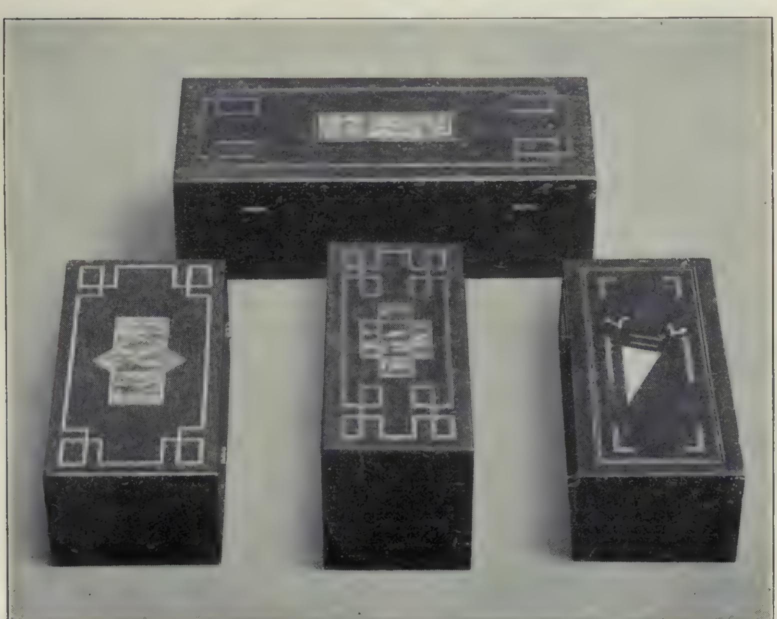
Arrangements should be made for accommodations at the banquet by correspondence in advance with the Secretary, A. C. Newell, State Normal University, Normal, Illinois; price of ticket, $1.00. It is expected that copies of the printed program will be available by February 1.

NATIONAL EDUCATION ASSOCIATION.

The preleminary program of the Department of Superintendence of the National Education Association for the meeting at St. Louis, February 27-29, promises a session of unusual interest, many of the topics being also of the kind to appeal to those interested in the manual arts. Under the main topic of "Organization Affecting the Course of Study and Economy of Time" there is to be a paper on "Some Adjustments and Changes in the Course of Study and

School Organization Suggested by the Needs and Capacities of Children that Vary from the Standards Set for Average Pupils." Under the head of "The Determination of School Efficiency" comes the sub-topic "How May a City Best Determine Its Unmet Educational Needs." On the evening of February 27, an address will be given on "Ideals and Modern Education" by A. Ross Hill, President of the University of Missouri. On the morning of February 28, the general topic is "Problems Relating to Child Welfare" under which are a number of sub-topics dealing with vocational training in the public schools. "Agriculture in the Rural School" is the topic for state and county superintendents' round table in the afternoon of the 28th. Other topics of interest are "America's Most Important Unsolved Educational Problems," "By What Standards or Tests Shall the Efficiency of a School or System of Schools be Measured?"

Meeting at the same time and in the same city are the National Council of Education and the Department of Normal Schools of the National Education Association, the National Society for the Study of Education, the Society of College Teachers of Education, the National Committee on Agricultural Education, and the Educational Press Association of America.



DONE BY PUPILS OF 11TH GRADE—BOYS' HIGH SCHOOL, FREDERICK, MARYLAND.

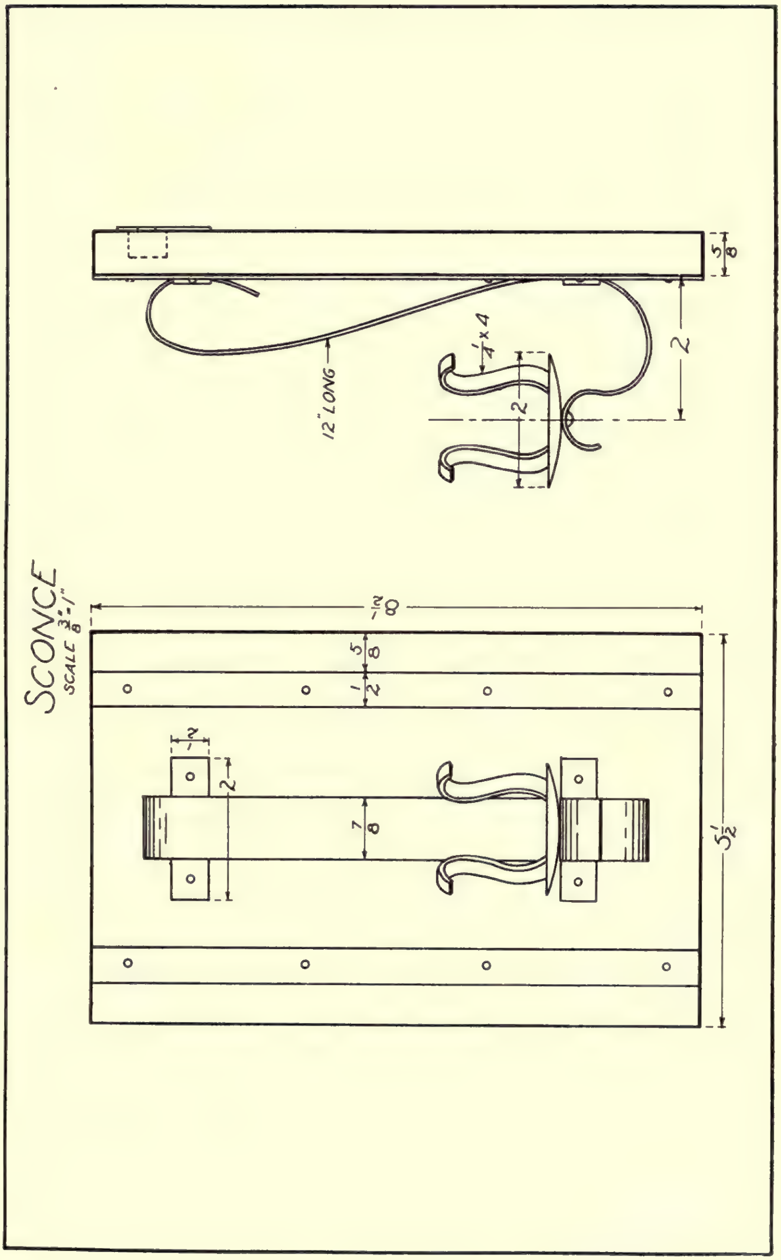
SHOP PROBLEMS

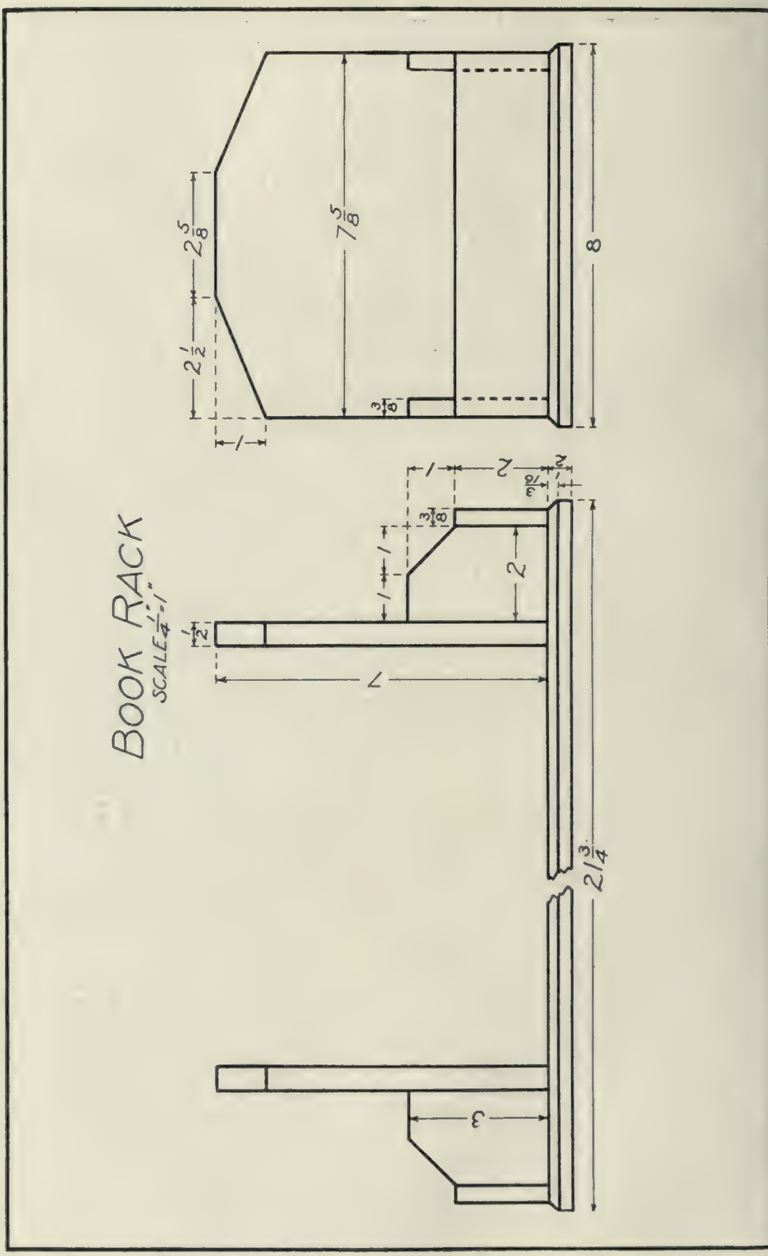
SCONCE.

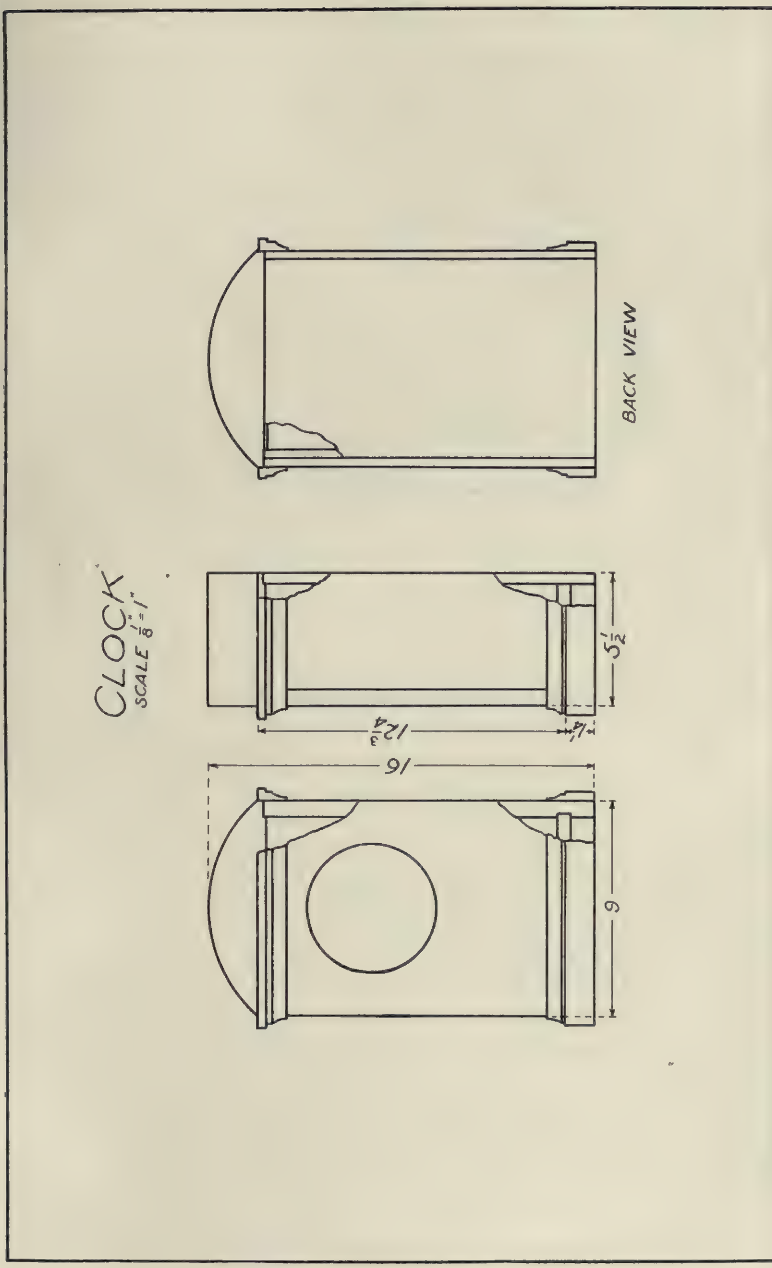
There is a trend in the manual training shops today toward the introduction of models which combine the use of both wood and sheet metal. This generally has its origin in the woodworking shop and is limited largely by the available equipment for metalworking. The sconce shown is a particularly attractive model which is so planned that it can be undertaken either in the metalworking shop with the minimum of woodworking tools or in the woodworking shop with but the most elementary of metal-working equipment. The body is to be made from a rectangular piece of oak in the back of which is bored a ½″ hole for the making of a blind eye. This blind eye is completed by covering the ½″ opening with a brass plate having a ¼″ hole thru it. Two strips of brass ¼″ by 4″, crossing each other at right angles at their middle point, are bent with the round nose pliers to the shape indicated on the drawing to form the candle holder. A 2″ disc of brass is pounded cup shape over a depression in a block of wood, to form a drip cup. The supporting piece to which the candle holder and drip cup are riveted is made from a piece of brass ⅞″ by 12″ bent to the curve shown, by the aid of the fingers alone. This is held in place by two strips ½″ by 2″, which are nailed to the back with brass escutcheon pins. A further touch of interest is added to the design by strips ½″ by 8½″ nailed ⅝″ from the vertical edges of the back.

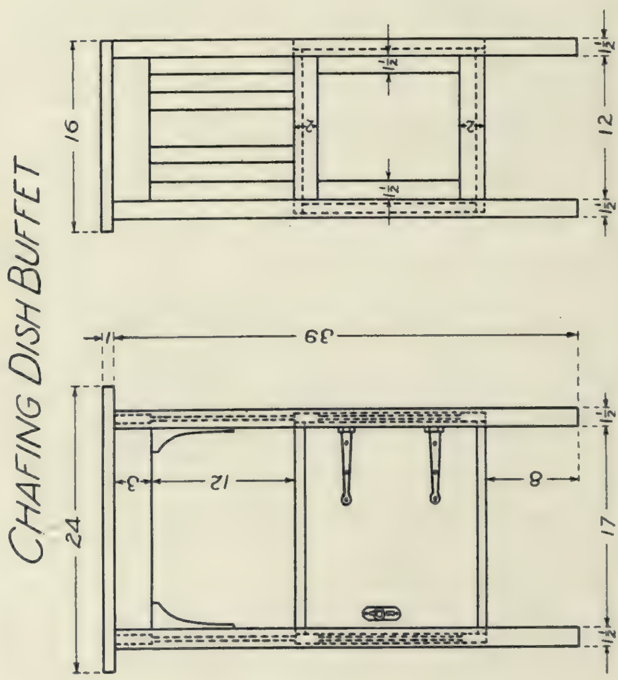
SCONCE.

The edges of the brass should be filed smooth and the surface cleaned with steel wool or fine sandpaper before it is bent to shape. After it has been shaped it should be protected by a lacquer of banana oil. If desired, the surface of all the brass used can be hammered instead of being finished plain. Copper might be used, tho a very pleasing color combination is secured when the oak is fumed, trimmed with brass and a yellow candle placed in the holder. The large piece of brass and the strips forming the candle holder should be at least as heavy as 18 or 20 gage, but the remaining pieces can be lighter.


SCONCE
SCALE 3/8" = 1"
12" LONG
1/4 x 4
2
5/8
8 1/2
1/2
7/8
5 1/2


BOOK RACK
SCALE 1/4"=1"


CLOCK
SCALE 1/8" = 1"
BACK VIEW
16
12 3/4
1/4
5 1/2
9


CHAFING DISH BUFFET
16
12
24
39
17
8
12
3

BOOK-RACK.

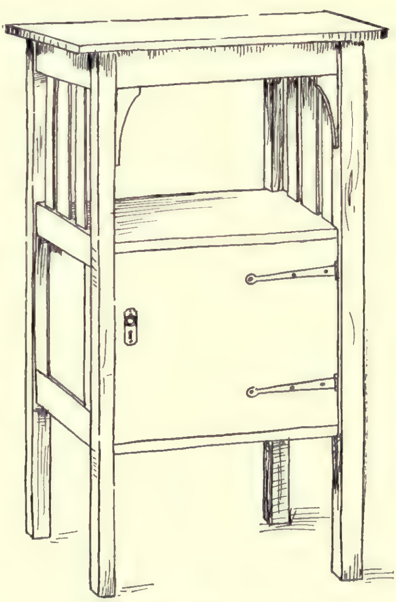
This design is one used in the eighth grade shop and drawing classes of John J. Tigert, Nashville, Tennessee. In addition to the usual form of rack, pockets have been constructed at each end which not only provide a convenient place to keep letters and postals but also serve to stiffen the rack itself. The outlines given in the working drawing are very simple and are capable of a number of pleasing variations. The ends of the pockets also seem to invite decoration in one form or another.

CLOCK.

The drawings for the clock were sent by Hans Schmidt of St. Paul. The method of construction is plainly indicated where the breaks are made. The shelf shown in the December number was designed as a support for this clock.

CHAFING DISH BUFFET.

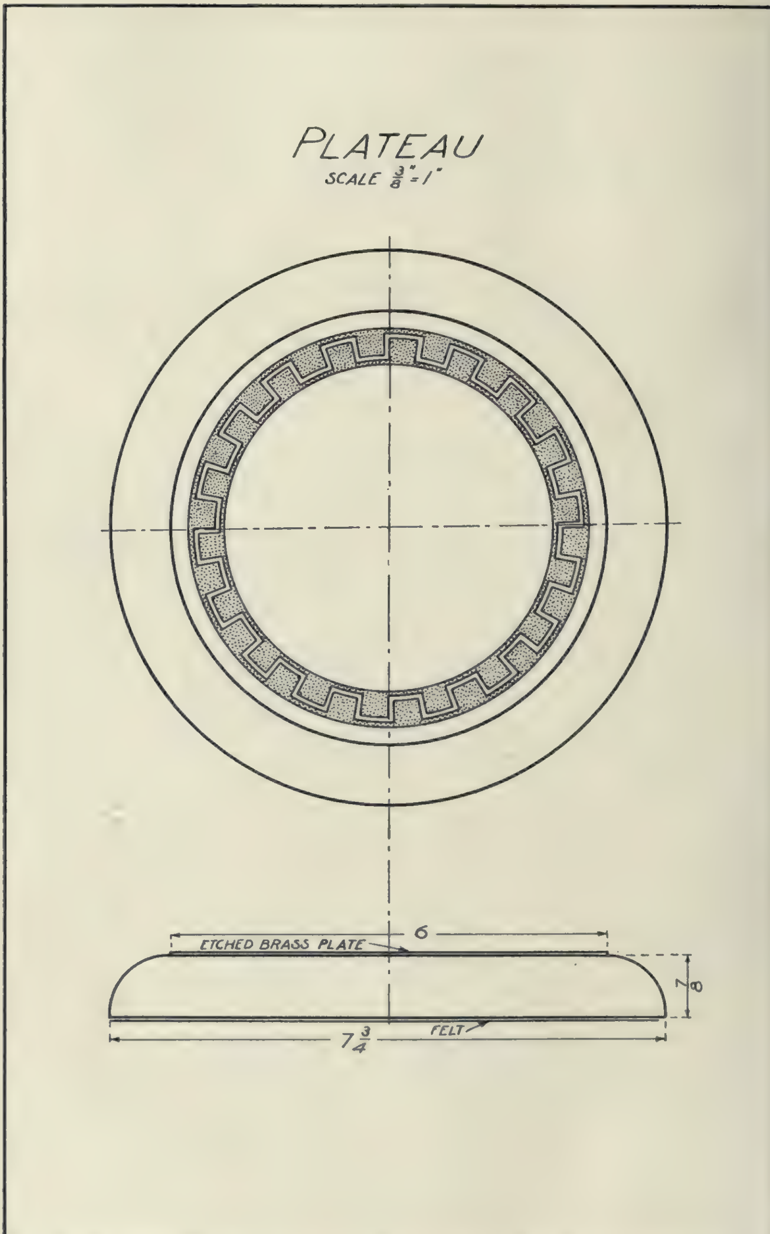
This well planned cabinet for the chafing dish was designed by F. V. Gill for the boys in the manual training department of the Reading, Pennsylvania, High School. While it is the most difficult of the problems for benchwork shown in this issue, yet it is simple enough to be constructed by first year high school boys.



CHAFING DISH BUFFET.

PLATEAU.

Another combination of wood and metal is presented in this plateau or support for a hot dish. The base is an exceedingly easy problem in faceplate turning. It is well made of mahogany or some close grained wood which can be given mahogany stain. The bottom is prevented from scratching the table by means of a covering of felt which is glued in place. The top is covered by a six″ brass plate upon which some simple border design can be etched by the aid of nitric acid. The background of this design should be oxidized by using a strong solution of butter of antimony in case the metal is brass, or with potassium sulphide if copper be used. In case it is inconvenient to etch a design upon the brass it can be made quite interesting by hammering it upon a hard surface with the round end of a ball pene hammer. Three short legs may be added to raise the plateau slightly above the table, if desired, and the felt omitted.


PLATEAU
SCALE $\frac{3}{8}$" = 1"
6
ETCHED BRASS PLATE
$\frac{7}{8}$
FELT
$7\frac{3}{4}$

CURRENT ITEMS

SOME INTERESTING CONCLUSIONS.

William C. Ash, principal of the Philadelphia Trades School, has made an investigation covering the larger cities of the country in order to discover to what extent manual training in the public schools has become industrial in its scope. The following, quoted from his report, are his conclusions:

1. Of the hundred cities questioned, sixty returned answers. Of the sixty, eight had no manual training in any form in their public schools.

In fifty-two cities having manual training, the shop work was distributed thruout the school system as follows: eleven in the grades only; four in the high school only; thirty-seven in both the grades and the high school.

2. The manual courses in the several cities had been in existence for periods varying from twenty-five years to one year. Two cities not included in the fifty-two, reported that they expected to introduce manual training as soon as funds could be raised. It was interesting to note that one city claimed manual training on the strength of a course in mechanical drawing which had just been introduced.

3. The time given to the work varied from one-half hour per week in the grades to ten hours per week in the high schools. The popular allotment was one and one-half hours per week in the grades and six hours per week in the high schools.

4. Twenty cities reported having re-arranged their manual training exercises with the idea of making the work larger, more practical, or in keeping with the industries of their own locality. The tendency in all these cities seems to have been to pass from the purely cultural aim of manual training to the more practical aim of industrial education.

5. Ten cities have modified their academic work in order to have it more closely related to the work of the shops. Three have shortened the time given to academic branches in order to make room in the roster for shop work, while three cities have increased the time given to academic work.

6. Fifteen cities have organized day industrial classes or schools. One additional city has organized an evening industrial school.

7. Of the fifteen day industrial schools, the entrance requirements are as follows:

Two require age thirteen, completion of the sixth grade.
Three require age fourteen, completion of the sixth grade.
Three require age fourteen, no academic requirement
Two require age fourteen, completion of seventh or eighth grade.
One has no age qualification, completion of the seventh or eighth grade.
Four have no age qualification, completion of the eighth grade.

8. The various trades are taught in the following numbers of cities.

Foundry work	1	Forging	3
House and Sign Painting	1	Cabinet Making	3
Plastering	1	Architectural Drafting	3
Textile Work	1	Mechanical Drafting	3
Die Cutting	1	Printing	5
Steam Engineering	1	Plumbing	5
Bricklaying	2	Electrical Work	5
Sheet Metal Work	2	Machine Shop Practice	6
Jewelry Manufacture	2	Pattern Making	7
Carpentry	7		

The last three trades: Machine Shop Practice, Pattern Making and Carpentry, are no doubt the most popular because the equipment necessary had already been installed for use in the manual training classes.

9. In answering the question as to the standing of the students in the trades after their graduation, one school reported that its graduates are credited with one-half apprenticeship, four reported their graduates to be well along in their trades, while the rest gave no answer, showing that no solution has yet been found for this very important problem in industrial education.

10. Five cities reported provision by state law for financial assistance for industrial education.

11. All but two of the existing public industrial schools reported, are supported out of the regular school budget. One is supported by a special budget and one by private contribution and state aid.

12. In all the cities reported, the industrial schools are operated under the public school authorities. In nine cities special supervisors or principals of industrial schools have been appointed, while in the others the work is directly under the supervisor of manual training.

13. To the question as to the supplying of teachers, one city did not answer, the others reported as follows: one used teachers' agencies; two wrote to schools like Pratt Institute, Cooper Union, Williamson, Stout and Bradley; three selected teachers from their regular staff; three had regular teachers for academic classes and tradesmen for the shops. In five of the cities the teachers in the industrial schools were all practical men selected from the shops.

14. But four cities reported any facilities being offered in the city or state for the training of teachers of industrial education. The work being done in all these cases in the state normal schools.

15. In three cities, the product of the industrial schools is sold. One city has iust passed a law enabling the industrial schools to sell their products.

16. In fourteen cities the products of the industrial schools are used in the public school department.

17. The annual per capita cost of operating the schools reported, varies from $60.00 to $208.00 according to the character of the work done.

18, 19. Reports of number belonging and attendance in the special classes and schools for industrial training vary from 18 to 186, for number belonging, and from 17 to 161 for attendance.

20. As to the decrease in the number of pupils leaving school between the ages of fourteen and sixteen since the introduction of industrial training, four

cities report that there has been a decrease, three that there has not been and eight that they are unable to say as the work has been started so recently that statistics are not available.

21. In answering the last question, as to whether the aim of elementary manual training should be cultural or industrial, the general opinion expressed was that it should be both, or as one superintendent expressed it; "Its aim should be to give knowledge of the industries. Such knowledge will be cultural as well as practical."

It has been the purpose of the foregoing to present the results of the work done by the public schools of our country in the line of industrial education.

EXTENSION WORK IN MANUAL TRAINING.

In the October number of this magazine we noted the arrangement of a circuit for manual training instruction, which includes the towns of New London, West De Pere, Chilton, Kiel and New Holstein, Wisconsin. This circuit is under the supervision of the extension division of the Manual Arts Department of the University of Wisconsin. We are glad to be able at this time to add details of this plan as furnished by Professor Crawshaw, head of the Department.

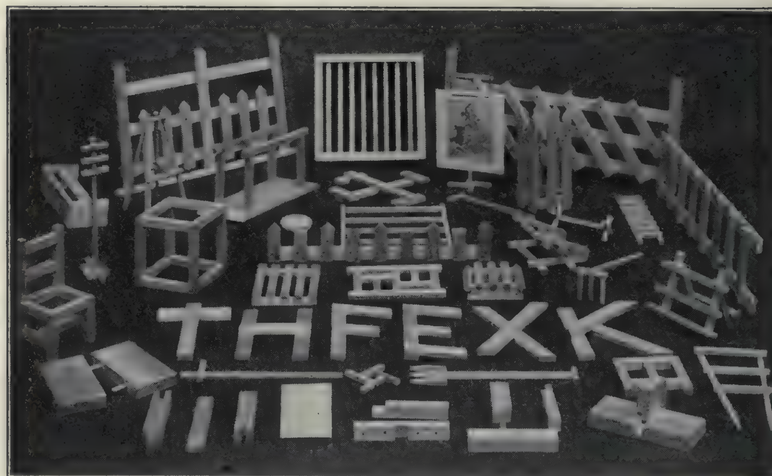
The work of the circuit is conducted in accordance with the following plan: An instructor who makes his headquarters at Appleton, visits each of the towns on the circuit once each week. During his visit he personally conducts classes in drawing and bench woodwork, giving demonstrations and individual instruction as he would if he were employed in one town only and met his classes every day. In addition to the personal oral intsruction the classes receive written instructions. The instructor leaves with his class each week, or whenever the work of the class demands it, typewritten instructions and blueprints for the project upon which the class is working and for the next succeeding project. By following these instructions the class continues work in the absence of the instructor.

The course of study is based upon the group which represents principles and exercises rather than models. The groups are arranged in a progressive sequence and include as many projects as serve to demonstrate the particulars to be emphasized by the group. Thus it is possible for every member in a class either to select the project for which instructions are written and blueprints furnished, and which is typical of the group, or to select some other project either in or outside of the given list so long as, in essentials, it belongs to the group. This plan operates to permit of a particular vocational emphasis being given to the course and, as well, to meet the individual pupil's needs and conditions.

The instructor, R. W. Hargrave, is a graduate of the Engineering College in the University of Wisconsin. He has had years of experience both as a teacher and as an employee and employer in industrial plants. He is therefore capable of handling classes with the proper educational and industrial values kept in mind. His experience thus far has proven two things. *First,* that bench woodwork may be taught, by the methods above described, with almost if not quite as much satisfaction to all concerned as by those followed by an intsructor who is employed to teach all classes in person. In this connection

LIGHT WOODWORK, 1912 COURSES

Arranged by J. H. Judd,
Superintendent of Handicraft, Manchester, England.



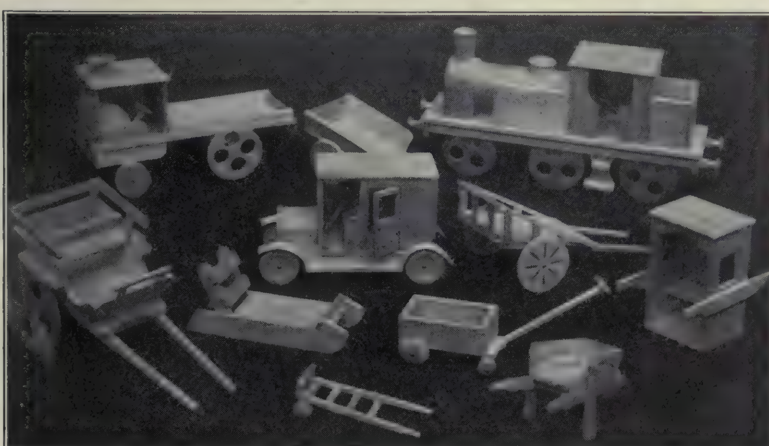
SERIES I.
PRELIMINARY PROJECT OF HOME, SCHOOL, INDUSTRY, AND RURAL LIFE.

SERIES III.
FURNITURE PROJECTS—"THE HOME BEAUTIFUL."

LIGHT WOODWORK, 1912 COURSES

Arranged by J. H. Judd,
Superintendent of Handicraft, Manchester, England.

SERIES II.
PROJECTS ASSOCIATED WITH HOME, SCHOOL, PLAY, AND RURAL LIFE.



SERIES IV.
HISTORICAL SERIES.
PROJECTS OF LOCOMOTION AND CONVEYANCE.

it may be said that in some respects the plan is superior to the one commonly used by a local instructor. For example, the initiative of the individual pupil is exercised to a greater extent; he becomes self-reliant almost from the beginning. He learns, also, to read and follow instructions. *Second,* that a course may be outlined definitely as to particulars and essentials, and generally as to content, which permits of flexibility in individual applications. This, of course, makes possible a line of work and a form of instruction whch meets both individual and community needs.

The expense of instruction is borne equally by the several communities in the circuit. Each community furnishes its own equipment in accordance with specifications and may if it chooses provide its own supplies. Arrangement has been made with the Manual Arts Department in the Appleton high school whereby wood for stock projects is there cut up and shipped to the several high schools. Each high school, also keeps on hand some stock lumber.

For those who are interested in the plan as described, it may be said that from recent reports received from the principals and superintendents of schools in the circuit towns, it is evident that they regard the work accomplished to date as highly satisfactory. In some cases they write enthusiastically about the whole undertaking.

THE DRESDEN CONGRESS.

With the date of the Dresden Congress on Art Education only six or seven months away our interests in that Congress must needs take an active turn if America is to be truly represented in the exhibition and program. Detailed information is available in the report made by James Frederick Hopkins, chairman of the American committee, on his visit abroad last summer in the interests of the American committee.

Mr. Hopkins first visited London, where he ascertained the ideas of the English leaders as to program, exhibits and similar important matters. From there he went to Paris, where a conference was held with the French and Belgian committee representatives and Charles M. Carter of Denver, then sojourning in Paris. As a result of this conference the hope was expressed by vote that "little time will be given to those questions already discussed and reasonably settled at the preceding congresses; and that the attention of the Congress will be given to the subjects listed in the preliminary circulars as 5, 6, 7, 8, and 9." These were as follows: (5) Cultivation of Taste by Teaching Drawing and Manual Work; (6) Teaching in Academies and Arts and Crafts Schools; (7) Artistic Letters and Letter Designs; (8) Training of Art Teachers; and (9) Artistic Education of the Masses. Much discussion took place about topic 5, the final opinion being stated as follows: "It is illogical that the instruction in drawing should be subordinated in any way to instruction in manual arts. The pre-eminence of drawing and design as the creative partner in the combination should prove that wherever the two subjects are correlated the direction and control of the study must emanate from the side of drawing and design, as in industry the drafting and designing room controls all the operations of the machine-shop."

Mr. Hopkins was empowered by this conference at Paris to represent France and Belgium at the meeting of the International Federation, August 14th, in Dresden, where the questions of program, exhibits, and time arrangements were thoroly worked out and brought to satisfactory conclusions. The final plans differed in a number of points from the preliminary circular, a fact which indicates much finesse on the part of the American representative in securing those features which were essential to the interests of the countries he represented.

The conference agreed on the following topics for the program from August 12th to August 18th:

I. Psychological basis of drawing. Child's first employment of drawing. Elementary teaching.

II. Drawing, modeling, and manual work as expression in general education.

III. Obligatory instruction in drawing from the kindergarten to the university.

IV. Fundamental principles underlying drawing in secondary schools.

V. Cultivation of taste thru drawing and manual work.

VI. Teaching in academies and arts and crafts schools.

VII. Lettering and letter designing.

VIII. Training of teachers.

IX. Artistic education of the masses.

The time schedule will be so arranged that the elementary portions of the program will be assigned to days and hours which will not conflict with the hours of lectures and papers on advanced subjects.

The method of procedure which is planned in regard to material is given in detail, using one topic as an example of the method. Using topic V. to outline the scheme, the first step is this; Any person interested in this subject in any nation may write papers upon it, said papers to be turned in to the National committee of the particular nation not later than April 1st.

(B) The National Committees will forward all papers that thus reach them to Dresden where the lists will be closed May 1st.

(C) There all papers received will be published in book form on July 1st.

(D) From the papers submitted, say in Subject V, from all nations, will be made a condensed report in three languages, German, French, and English, closing with a thesis for discussion before the Congress.

(E) Meanwhile, carrying out the desires of the Dresden Committee, some nation has invited, thru its national committee, its best speaker (therefore regarded as the best world's speaker), on the particular subject, say subject V, to prepare and present an address on the Dresden platform as the leading speaker for the subject. Within the time allowed to him, said speaker is an absolutely free agent to say what he chooses concerning what he believes to be the best conditions of the subject, (naturally in doing this he will probably voice his national viewpoint).

(F) Meanwhile, carrying out the desires of the Dresden Committee, some nation has invited, thru the National Committee, a representative speaker on the particular subject, say in Subject V, to prepare and present a shorter address on the Dresden platform as the secondary or cooperating speaker for the subject.

As was the case with the leading speaker he shall be, within the time allowed him, absolutely free to voice his point of view. (Naturally he too will present a national viewpoint).

(G) Following the leading speaker and the cooperating speaker will come opportunities for discussions limited to seven minutes. In this field interested persons in the Congress with pet ideas on the subject, say subject V, having read the thesis for discussion, will rise, proceed to the platform and within the time allowed present their views in their home tongue.

(H) From the papers presented (a), from the best thought of the leading speaker (e), and the helpful utterances of the cooperating speaker (f), plus the good things brought out in discussion (g), will be formulated the Resolution of the Congress, say in subject V, which will undoubtedly be widely influential in art educational policy, marking a milestone in our progress.

(I). After the Congress is over, the proceedings will preserve all papers, the thesis for discussion, the addresses of leading and cooperating speakers, the program, list of members, resolutions, etc.

In this way the German Committee have avoided the isolation of sectional meetings, and the confusion and repetition incident to previous Congresses; and will have secured the leading world speakers on the several subjects for platform speakers, and also the best thought the Congress may evolve.

Of equal interest are the exhibition arrangements. Mr. Hopkins made a thoro examination of the avaliable space in Dresden and secured for America about one sixth of the space, including a certain very choice section. The assignment of space "gives America the dominating place among cooperating nations." The holding and filling of this exhibition space is an opportunity never before presented in any Congress or World's Fair and one which will require the financial and active working cooperation of all American teachers of the arts and allied subjects.

CHANGES AT BRADLEY INSTITUTE.

Some far-reaching changes are taking place in the manual arts department at Bradley Institute this year. Plans are being made for the opening of a new vocational school next September, for boys who wish to become woodworkers or metalworkers or draftsmen. This will not only provide facilities for the increasing number of boys who wish to pursue courses preparatory to entering the mechanical industries, but it will enable the Institute to extend its offering of courses for the training of teachers of the manual arts. It is now proposed to add one year to the teachers' course for such as wish to take positions in manual training high schools and vocational schools. Courses in educational psychology and the history of education will be included in the new group of studies, but the chief factor in the additional year's work will be practical experience in a shop organized as a factory and more instruction in practical drafting.

With this end in view Ira S. Griffith director of manual training at Oak Park, Illinois, and formerly professor of mathematics at Eureka College, has been appointed assistant professor of manual arts to begin next summer. Professor Griffith will teach some of the classes in pedagogy and take charge of the studies in the vocational school not included in the shopwork and drawing. H.

A. Parsons, formerly superintendent of the factory of the Grand Rapids Handscrew Company and the Willmarth Showcase Company, has been selected to become the foreman of the new shop for woodworking.

Besides the day vocational school, two short-term courses lasting about twelve weeks will be opened to meet the needs of farmers who wish to get instruction in building or machinery. The building course will include practical carpentry, concrete construction, architectural drawing, mathematics, science and English especially adopted to the needs of the farmer. The machinery course will be similar, including blacksmithing, the construction and repairing of farm machinery, the study of gasoline and electric motors, elementary machine drawing, mathematics and science. For this short course a special staff of instructors is being selected. The course will open in December, 1912.

WISCONSIN.

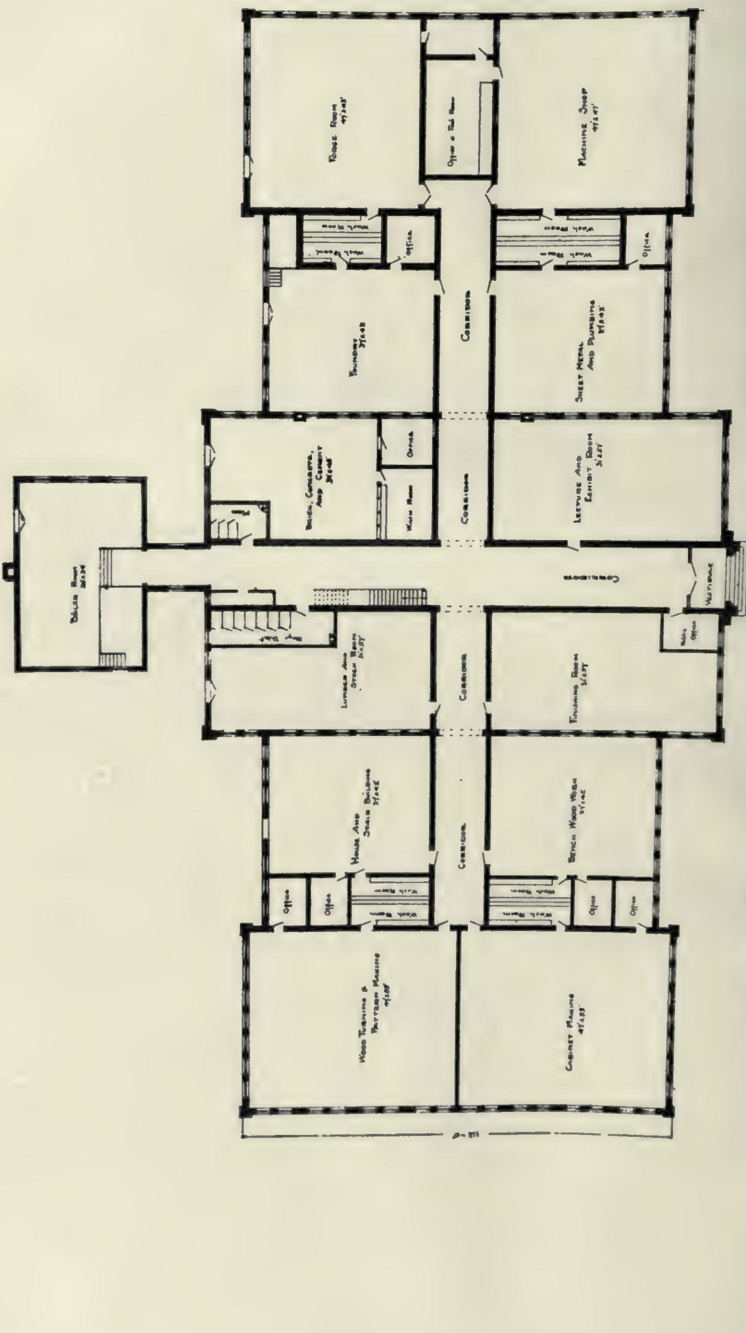
The completion of a new high school building at St. Croix Falls, made possible the opening of departments of manual training and domestic economy this year. The manual training equipment, consisting of twenty benches, a band-saw, one lathe, and an abundant supply of tools, occupies a large well-lighted room on the first floor of the old building. The room is supplied with built-in cabinets for pupils' work with two sinks, with hot water connections, and a long bench for glue and stain work. A good feature of the management of classes is the plan which allows a plane-iron to each student, who can thus personally control its condition. Each of the high school boys has a chisel, also for his individual use. This should insure greater care in the use of edge tools on the part of students.

The domestic science work is accomodated in a room on the second floor of the same building and is equipped for the use of classes of twenty. Laurence M. Hermman is supervisor.

At the beginning of the present college year the University of Wisconsin assumed the responsibility of administering the affairs of the Wisconsin Academy, a private secondary school located in Madison. The school is now known as the University Demonstration School and will in the near future be housed in a new building on the University of Wisconsin campus. It will serve as a place where prospective teachers may do practice teaching under the supervision of experts and where they may observe the teaching of these experts.

At present the Manual Arts Department in the University is taking care of classes from the Demonstration School in both mechanical drawing and woodwork. As provision for this work was made after the regular class schedules for the year were arranged the Manual Arts work is done after regular Demonstration School hours. Classes meet on alternate days at 3:30 P. M. and continue work until 5 P. M. Thus each class receives instruction for three hours each week. The election of work is voluntary. Once a boy elects the Manual Arts, however, he continues in a regular class throughout the semester.

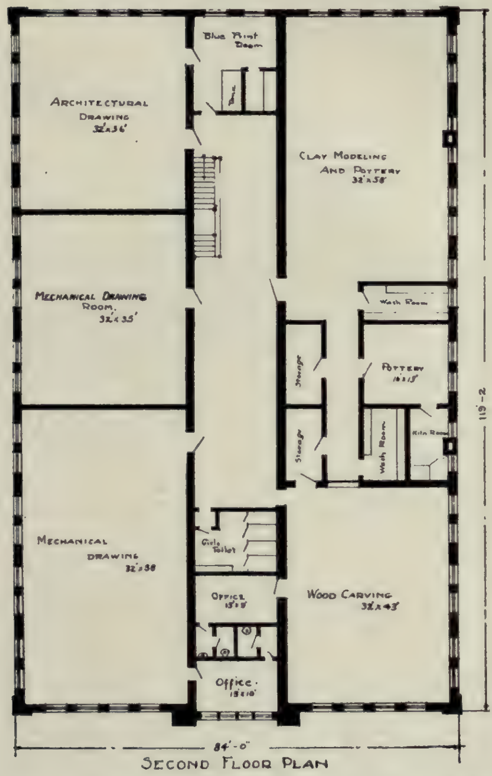
All those registered have shown a keen interest and a desire to put in even more than the required amount of time. Some who did not elect the course at the beginning have applied for admission but have been refused this privilege until another beginning class is formed.



FIRST FLOOR PLAN—INDUSTRIAL ARTS BUILDING, STATE NORMAL SCHOOL, PITTSBURG, KANSAS.

The work is proving attractive not only to members of the Demonstration School class but to those in the normal classes in the University who have an opportunity both to observe and teach manual training woodwork.

—F. D. CRAWSHAW.



SECOND FLOOR PLAN—INDUSTRIAL ARTS BUILDING, PITTSBURG, KANSAS.

OKLAHOMA.

A growing interest in manual arts in Oklahoma is evidenced by the continued expansion in that department of the Central State Normal school at Edmond. New quarters consisting of four large rooms with added storage space have been arranged and equipped with new machinery and new tools. Six lathes, a combined oilstone and grinder and a forge have been installed, completing the machine-shop equipment which already had in use a band-saw,

a scroll-saw, a trimmer, and copper working tools. A three hundred dollar printing outfit is another addition of interest. Fifty new books on manual arts and industrial education are on the shelves of the shop reference library.

The following courses are offered by the Department in Edmond: paper and cardboard construction; knife work; weaving; raffia and reed work; clay modeling; elementary and advanced benchwork; cabinet work; wood-turning; elementary and advanced pattern-making; principles of foundry work; forge, cement, and art metalwork; metal-spinning; and printing. During the year lectures are given on industrial social education.

V. D. Wilson has been in charge of this department for the past four years.

WASHINGTON.

H. F. Dewey, State Superintendent of Public Instruction has just issued his annual directory of high school teachers in the State of Washington for the school year ending June 30, 1912, giving the names of all high school teachers, their training, subjects which they teach, and their annual salaries. From it a number of facts regarding teachers of manual arts have been compiled which may be of interest to our readers. There are 129 teachers of manual arts in the state who are actually teaching high school classes. This does not include teachers of grade work nor supervisors. 44 of these are college graduates, 72 graduates of normal schools and institutes for manual art teachers, and 13 have attended college but have not graduated. The average salaries of the 45 teachers in the three largest cities of the State; Seattle, Spokane and Tacoma, are $1,317 for men and $1,234 for women. In the high schools outside of these cities the men receive $965, and the women $814. The Superintendents and Principals who teach manual arts in addition to their other duties, of whom there are ten, receive on an average $1,298.

IDAHO.

During the last five years the manual arts, including domestic economy, have been widely introduced into the state of Idaho. Nearly all of the larger schools have installed these courses; and the smaller schools, catching the spirit of progress, are now busy introducing these departments with equipment varying from one bench and fifteen dollars worth of tools to twenty benches and an expenditure of several hundred dollars. Agriculture is also being added to the course of study in many places, all three subjects having been added to the state course.

The normal schools at Albion and at Lewiston have two year courses in manual training and domestic economy and an elementary course in agriculture. The State Academy at Pocatello also has a strong manual arts department.

The first high schools to introduce the work were Boise and Lewiston. At Boise two year courses are given in shopwork, drawing, cooking, and sewing, under the supervision of Glenn H. Hill.

In Lewiston the teaching of manual training was begun three years ago with an equipment of twenty benches. The work was offered to the upper grammar grades, high school students being allowed to take the work after school hours or an Saturdays if they wished. At the opening of the present

school year a new manual arts building was ready for occupancy, and both manual training and domestic economy were introduced as regular high school subjects on a University of Idaho credit basis. A special manual arts high school course is being planned.

A new shop has been added to one of the ward buildings providing better facilities for the grade work. A course in agriculture was added this fall and a block of ground adjoining the manual arts building was devoted for experiment work connected with the course.

C. A. Steelsmith is director of manual training at Lewiston and Miss Lura Edna Dewey directs the work in domestic economy.

PRINTING IN SPRINGFIELD SCHOOLS.

A new departure in the schools at Springfield, Massachusetts, is the introduction of printing for eighth grade boys. Two schools have been equipped with hand presses. The boys are now at work in their bench-work classes making galleys, racks for type cases, and composing sticks. They will print notices for the school, tickets, cards and circulars. In addition they will be given instruction in making zinc etchings, using drawings from the art classes, for the cuts. School newspapers are already being planned by some ambitious students. It is felt by the supervisors that this work will provide a fine means of correlating manual and academic work. There will be a certain practical value also for most people in business life have sooner or later some connection with print and printers. At such a time a first hand knowledge will prove a time and money saver.

TEXAS.

El Paso, Texas, has manual training in all of the grades and in the first year of the high school. The work is conducted in seven manual training shops, four cooking laboratories, and nine sewing rooms. W. A. Burk, the supervisor, has four assistants in manual training and five in domestic science and art. A new high school building is hoped for which will make possible a full four years course in high school manual training, the present high school being too crowded to afford the necessary space.

C. C. Golden and E. C. Beezley of the Kansas State manual training school, and G. W. Dauth from Teachers College, Columbia University, are new instructors in woodworking at El Paso. There are two new teachers in the domestic science and art department also, Miss Marie Lampe, of Pratt Institute, and Miss Dora Hart of the Colorado State Normal School.

The Sierra Educational News, the official organ of the California Educational interests, begins the new year with a new business manager and a new editor. James A. Barr of Stockton was the unanimous selection of the Council of Education for the position of business manager. Mr. Barr has had twenty years of successful experience as superintendent of the Stockton schools, and in addition has been eminently successful as an organizer of educational movements and associations. Gratifying results have followed his efforts in behalf of better salaries, a more certain tenure, and pensions.

The magazine is to be congratulated also on securing Arthur H. Chamberlain for editor. Mr. Chamberlian has a national reputation as an authority on the manual arts and industrial education. He knows the educational situation in California thoroly, having had seventeen years of varied teaching experience in the state, including his service as professor of education at Throop Polytechnic Institute. Not only this but Mr. Chamberlain has been identified with the larger national interests and societies in the United States and has added to these activities the broadening influence of European travel. He is already well known as a contributor to periodicals and as a writer of books on educational topics, the following works being the product of his pen, *Standards in Education, Technical Education in Germany,* a series of manuals on *Industrial Education,* and a *Bibliography of the Manual Arts.*

On Saturday, November 16th, Mr. William S. Mack of Scott, Foresman & Company suffered from a paralytic stroke and his death occured on the following Tuesday afternoon.

Mr. Mack has been so well known as superintendent of schools and later as Chicago manager of the Prang Educational Company that his death will be regarded as a distinct loss to the profession as well as the business. The following statement issued by Scott, Foresman & Company will express the feeling of many teachers toward Mr. Mack:

"Through his association with us in business the past four years, we had come to admire him and love him.

"In his sudden death we are bereaved of a true friend and helpful coworker. We are glad to make this public testimonial of our appreciation of his sterling character, and our sorrow at the loss of his companionship."

The experience of the Friends School, a rural school in Berks county, Pennsylvania, shows how manual training work may be started in a rural school without special funds for the purpose. The school possessed two fine unframed portraits. The teacher Lawrence C. Kline, suggested that the boys make the frames, using odds and ends of oak or walnut lumber brought from home, and such tools as could be spared from the home workshop. The boys responded enthusiastically, and work began next day. The first step was making a workbench, odd desks and lumber from the attic serving for material. Then drawing-boards and tee-squares were made as a basis for further work. Next the frames were made, and other pieces of school furniture soon followed. An individual drinking-cup cabinet was devised by the pupils. This year bird houses are occupying their attention. The time occupied is largely rainy day recreation periods, and noon hours. No great expense has been incurred, a few nails, stain, and a few pieces of lumber being all that has required the expenditure of money. Surely with such an example teachers cannot defer manual training work on the ground of no funds.

The past year has been marked by an advance of manual training into schools of all kinds, both public and private. Boys' schools especially are featuring manual training in their curricula. From the New York Military academy at Cornwall-on-Hudson comes news of a new course of study which is practical in its aim. It includes a large amount of manual training and mechanical drawing in addition to commercial branches and academic subjects of a practical trend. The manual training shop is fitted up with modern machines, with lathes, a drill-press, band and cross cut saws, a pipe-cutting machine and a sander.

This "practical" course is in charge of E. E. Cortright, with D. K. Hiett of Kane, Pennsylvania, as supervisor of shopwork.

CEMENT WORK AT THE LASALLE-PERU TOWNSHIP HIGH SCHOOL, ILLINOIS.

REVIEWS

Isometric Drawing. By Alpha Pierce Jamison. McGraw-Hill Book Company. 9¼x6½ in.; pp. 69; illustrated. Price $1.00.

The subject of isometric drawing is usually discussed in a very few pages in books on descriptive geometry or mechanical drawing, thus giving only the rudiments of a very interesting and useful art which must be better known to be properly appreciated. To give the student of drawing the opportunity of securing a good working knowledge of this subject is the purpose of the author of this text. The book does not deal with the theory but is concerned entirely with the practice of the art, with the "how" rather than the "why." The opening chapter of explanations and preliminary discussion is very clear and concise. Chapter two explains the drawing of plane figures; chapter three explains the drawing of solids; and chapter four outlines a possible course in isometric drawing which will prove suggestive to both teachers and pupils.

The book is fully illustrated, each isometric drawing being accompanied by a working drawing of the same object. The make-up of the book is attractive and teachers and students alike will welcome this text book on a subject of growing popularity and value to draftsmen. Professor Jamison writes with authority, having had much experience in the subject —V. E. WITHEY.

Design for Schools. By Charles Holland. The Macmillan Company. 7½x10½. Illustrated. Price $1.90 net.

This book written by a teacher in an English school of art, presents, of course, the English point of view, which differs in many ways from the view of American teachers of design. The book is fully illustrated and art teachers will find many suggestions in the illustrations tho the text presents little that is new. The drawings from nature are especially commendable but many of the designs evolved from them appear too full of details and too complicated. However, every book on design is welcome for the suggestive material it may contain.

American Art Annual, Florence N. Levy, Editor, 215 West 57th Street, New York. 9x6½ in.; pp. 337. Illustrated. Price $5.00 net.

The 1911 volume of this indispensable annual has several very attractive features. Notably so is the review of mural paintings in the United States, which includes a list of works, with their locations, and the names of the artists, who executed them. New but representative illustrations of this art accompany the text. Also very interesting is the article on "Painting, Prints, and Art Objects as Investments." A complete list of members of the National Academy of Design, headed by the name Edwin A. Abbey, is given, with Abbey's portrait in connection.

The book has the usual list of sales of paintings, list of paintings sold at auction, reports of art museums and art societies, a list of professional art schools, and obituaries of artists with portraits. The directory of contemporary artists was found to have increased to such an extent that a separate publication is necessary, so no such directory will be found in this number.

The illustrations are of pleasing variety, including prize paintings, new buildings for art purposes, new sculptures, and such well known recent subjects as Sergeant Kendall's "Alison" and Alexander's "Sunlight." —V. E. WITHEY.

RECEIVED.

Suggested Course of Study in the Industrial Arts for Elementary and High Schools. Prepared by a special committee of the Manual Training Round Table of Southwestern Ohio, Pliny A. Johnston, Woodward High School, Cincinnati, Ohio, Chairman. This report outlines courses in paper industries, printing, frame house construction, woodworking, metalworking, cabinet-making, wood-turning, pattern-making, forging, and machine shop practice.

Manual of the State High School Board of North Dakota, 1911. Richard Heyward, inspector, Grand Forks, N. D. Contains outlines of courses in agriculture, manual training, domestic science and art, and mechanical and freehand drawing.

Fruit Growing Clubs. October number of the Eastern Kentucky Review, State Normal School, Richmond, Ky. Tells how the school children of Eastern Kentucky are being organized to grow 100,000 apple trees next season.

Annual Report of the North Bennet Street Industrial School, Boston, Mass., 1911. Contains many interesting details concerning this historic center of good influences. Ten pages and five full-page illustrations are given to the prevocational school.

Travelogues in Furniture. Six beautifully printed and illustrated little folders, each giving distinguishing characteristics of one of the historic styles of furniture—Louis XVI, Flanders, William and Mary, Sheraton, Adam-Chippendale, Colonial, Berkey and Gay Furniture Company, Grand Rapids, Mich.

Lamps and Shades in Metal and Art Glass. By John D. Adams, Popular Mechanics Co., Chicago. Price, 50 cents. This is one of the "Popular Mechanics Handbooks," already well known.

The Determination of Cotton and Linen. By Alois Herzog, translated by Ellen A. Beers, Technical Education Bulletin, No. 7, Teachers College, Columbia University, New York, N. Y. Price 25 cents. An illustrated pamphlet of 35 pages.

Training the Boy to Work. By William A. McKeever, Manhattan, Kansas. Home Training Bulletin, No. 6. Price, a two-cent postage stamp. Gives a program of home work that may be done by a boy each year from four to fifteen inclusive.

Courses in Mechanical and Freehand Drawing. For use in trade and intermediate schools. Published by the Bureau of Education, Manila, P. I. 108 pages, including many illustrations. The first part is devoted to suggestions to the teachers; the second outlines a course of study in mechanical and architectural drawing; the third deals with freehand and decorative drawing. An appendix contains definitions, drawings of school and office furniture in use in the Philippines, the conventions used in mechanical drawing, and other needed data.

Elementary Woodwork. By Louis C. Dewey, director of maunal arts in the high school, Manitowoc, Wisconsin. Book of 125 small blue prints for sale by the author. Price, $1.50.

Complete Joinery. By Louis C. Dewey, director of manual arts in the high school, Manitowoc, Wisconsin. Book of small blue prints of 144 joints for sale by the author. Price, $1.50.

About half of the problems in the first book are joints taken from the second; the remainder, are well selected models. The draftsmanship in both is very satisfactory.

Kiln-Drying Hardwood Lumber. By Frederick Dunlap. Forest service circular No. 48, 1906. U. S. Department of Agriculture, Washington, D. C.

State Course of Study, Missouri, 1911. William P. Evans, State Superintendent of Public Schools, Jefferson City, Mo. This contains a very helpful outline for elementary handwork.

Annual Report of Public Schools. Houston, Texas. 1910-1911. Contains report of the supervisor of manual training, giving facts concerning the development of the work and its cost.

Catalogue of the Francis W. Parker School, 1911-1912, 330 *Webster Ave., Chicago, Illinois.* Gives outline of a curriculum in which handwork plays an important part.

Hull-House Year Book. Hull-House, Chicago, Illinois, May 1, 1910. Price 10 cents. An illustrated pamphlet of 58 pages, describing the activities of this unique social and educational center.

The Story of Bread. An attractive and interesting pamphlet issued by the International Harvester Company, Chicago, Illionis.

Industrial Education as Carried on at the Jewish Orphan Asylum, Cleveland, Ohio, 1910. This is an outline of the industrial studies, and a statement concerning their development during the past four years under the direction of Charles Marten, head of the department of Industrial Arts. In this pamphlet of forty-six pages Mr. Marten has given a syllabus of the work of the first six grades by months, and the seventh and eighth grades by subjects. Outlines of courses in industrial and commercial history and geography and in elementary applied science are included.

Western Drawing and Manual Training Association. Report of Springfield Meeting held May, 1911. Lucy S. Silke, 3307 Rhodes Avenue, Chicago, chairman of editorial board. 212 pages of text and 15 pages of plates. This contains the papers and addresses formally presented, and in addition to these an edited stenographic report of discussions and business. It fully maintains the high standard of report set by this Association.

VOLUME XIII NUMBER 4

MANUAL TRAINING MAGAZINE

APRIL, 1911

A LESSON PLAN AND SOME SHOP LECTURE OUTLINES.

A. C. NEWELL.

IT has been charged, and with more or less truth, that the manual training teacher is not always a success. It is also true that the average trade school instructor, who at present is inclined to assume that he is the only really competent person to teach the mechanic arts, is not at all a success in teaching large classes, altho he may know how properly to instruct a few individuals much as apprentices have been taught in the past.

During the past few years I have given much attention to a consideration of the advantages and disadvantages of both class teaching and individual instruction. Space will not permit an extended discussion of this question here, but suffice it to say that I am firmly convinced that class teaching is far better at the beginning of any course in shopwork. It may be supplemented to some extent by individual instruction. Later on the latter method may in a large measure take the place of class teaching.

A lesson given to a class in manual training ought to be just as carefully thought out and organized as is the case in any other subject. A good lesson-plan outline if carefully followed will improve the organization of the subject matter and the methods of teaching, and usually the research necessary in the preparation of the lesson according to a systematic plan will increase the technical knowledge of the teacher.

LESSON-PLAN FOR CLASS INSTRUCTION IN MANUAL TRAINING.

1. *Unit of Instruction.* The subject of the lesson should be a unit of thought or a process taken from the industrial world.

2. *Organization of Subject matter.* The proper sequences of the operations considered and the relative values of the thoughts developed should receive careful attention.

3. *Aim.* The aim of the lesson should be to bring an experience to the pupil thru the mind and hand in the development of some process or thought related to the industrial world.

4. *Assignment.* The work planned should be definite, and should perfectly illustrate the process considered in order that the aim of the lesson may be realized.

5. *Preparation.* At the beginning of the lesson a brief review of previously learned industrial processes pertinent to the lesson should be conducted by the teacher.

6. *Order of Presentation of the Lesson*:

   I. Discuss the use of the object to be made and the materials.

   II. Design. A. Thinking out the forms: Proportion, Outline, Strength, Decoration. B. Freehand sketch. C. Working Drawing. (Mechanical).

   III. Construction. D. Getting out stock. E. Tools used, and processes of work. F. Planing the stock to size. G. Laying out, and method of joining. H. Cutting to size. I. Testing accuracy of work. J. Assembling. K. Finishing.

7. *Generalization.* The process taught should if possible be compared with other processes for accomplishing the same result. Its relation to other processes used in connection with the lesson should be pointed out also, in order that the principles involved may be better understood.

8. *Application.* Point out the practical application of the process or principle taught by giving illustrations taken from the industrial world. The illustrations given should, if possible, be taken from things familiar to the child.

OUTLINE OF SHOP LECTURE ON KNIFE AND CHISEL-LIKE TOOLS.

Unit of Instruction. Sharp edged tools which may be classified as knives or chisels are the most important and valuable tools that have been invented by man.

Aim. The aim of the lecture is to point out to the student the value of edge tools to civilization, and to teach the fundamentals in the classification, construction, care, and use of such tools.

Assignment. Definite problems in the use of edge tools should be

FIG. 1.

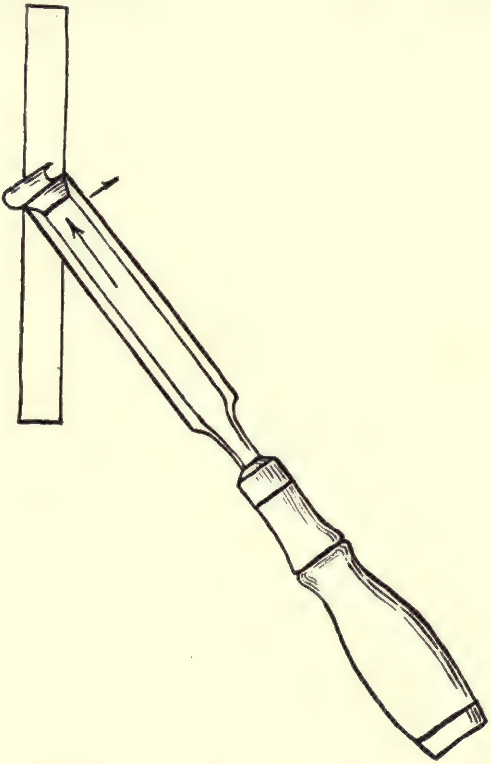


FIG. 2.

FIG. 1. SINGLE PRESSURE CUT. FIG. 2. DOUBLE PRESSURE CUT.

assigned at the time this lecture is given so that the student may realize the value of the instruction to him.

Order of presentation.

1. Edge tools do the actual work while other tools in general are simply helpers.

2. The nature of the various cutting processes should be understood.

3. Two ways of cutting with edge tools: a. Cutting with the force applied in one direction, sometimes called a direct pressure cut. b. Cutting with two forces applied approximately at right angles to each other making a sliding or knife cut.

4. Tools used with a single pressure cut; rip-saws; lips of auger-bits; machine cutters on jointers, planers, circular saws, mortise machines and band-saws.

5. Tools used with a double pressure, sliding or knife cut: knives; cut-off saws; nibs of auger-bits.

6. Tools which may be used with either the single or double pressure cuts: chisels, (all kinds carpenters', turners' and carvers'); gouges, all kinds; planes; spoke-shaves; draw-knives.

7. Heavy rough work usually requires the direct pressure cut. (Cutting mortises with mallet and chisel.)

8. Finishing work can be done smoothest and best by the double pressure or sliding cut, as in this case the fibers are cut off by the cross action of the fine teeth, or invisible notches, on the edges of sharp edge tools, instead of being torn or split apart.

9. The angle of bevel for wood cutting tools should be about 20 degrees for soft wood and 25 to 30 degrees for very hard woods. A second bevel or slightly greater whetting angle at the cutting edge is not objectionable; except with turning chisels, where a flat bevel is much better for some kinds of work. Carving tools should be purposely sharpened with a round or convex bevel.

10. Most cutting tools should have the corners slightly rounded off to keep them from leaving a line or shoulder. The cutting edge of such tools is a straight line except at each end. Some tools such as the jack-plane, spokeshave and draw-knife have cutting edges in a curved line or arc of large radius.

11. Edge tools should be properly ground on a grindstone, then finished by whetting on an oilstone. The grindstone should be rather coarse and soft, and kept wet only when grinding tools. Water on a grindstone keeps it from "gumming up" by removing the particles of steel and stone that have been worn off in grinding. Soft Arkansas stones, Washita stones and India stones are very satisfactory as whetstones. Various kinds of oil may be used on such stones to keep them from "gumming." A strap should be used for finishing. A little fine emery powder mixed with lard and applied to the strap, or a razor strap preparation, will make the leather "take hold" better.

12. The peculiarities of each kind of edge tools may be considered if time permits. The parts may be named, etc., but usually another lecture should be given and illustrated.

Generalization. Files, scrapers, and sandpaper are sometimes used in the place of edge tools, but the result is always very unsatisfactory and such processes are too slow. Cutting tools remove the wood rapidly and should always be used first; but they may be followed by scraping tools in preparation for finishing.

Application. Edge tools are used in the reduction of all rough stock to finished sizes, in the joining of all the parts of furniture and buildings, in boring holes, and, in the form of saws, in cutting down trees in the forest. Tools for measuring and marking, pounding, holding, scraping, sharpening, cleaning, etc., are merely auxiliary tools which make it possible for the cutters on the edge tools to do more accurate, more rapid, or better work of various kinds. A knowledge of the proper method of using each of the various kinds of edge tools is very important to a worker in wood or metal.

References: *Noyes,* Hand Work in Wood.
Griffith, Essentials of Wood Working.
Hasluck, The Handy Man's Book—Wood Working.

OUTLINE OF A SHOP LECTURE ON GLUE.

Unit of Instruction. Glue is used to great advantage in the industrial world, consequently its use is an important process which should be discussed in lectures to high school students in manual training.

Aim. The aim of the lecture is to create a greater interest in the materials used in manual training by giving instruction in the school shop about such important industrial processes as the manufacture and use of glue, and finally to teach the students how to test, prepare, and use it intelligently.

Assignment. The pupils should be required to make a somewhat difficult glue joint after the lecture, but their work should be assigned to them before the discussion is begun.

Order of Presentation.

1. Glue is an adhesive gelatine.
2. It is manufactured from the refuse parts of animals and fish.
3. The best animal glue is made from scraps and unused parts of cattle hides.
4. Bone glue is of poor quality. It is used for sizing.
5. There are many grades of animal glue. The best is of a light clear amber color, and breaks with a shining glass-like fracture, yet it should be flexible and bend considerably before breaking.

6. Tests for good glue.—No bad odor, no grease, nor foam; great water absorptive capacity, non solubility; lack of too great hardness and brittleness, yet drying hard instead of gum-like and leathery. The viscosity when melted, the temperature of the melting point, and the rapidity of setting are other tests.

7. Manufacture. The refuse materials from the packing houses are treated with chemicals, then boiled, and the gelatine or glue is obtained.

Hides are usually treated with lime water to get rid of any fat, and afterwards they are boiled.

Bones are covered with dilute acid to get rid of the salts of lime.

After boiling, the gelatinous material is collected in cooling tanks, then dried in the open air.

8. Cold glue. It is manufactured from the refuse parts of fish.

It dries slowly, so is advantageous in some work. It does not make as strong joints as hot glue of a good grade properly used.

9. Method of preparing hot glue. Break up the sheets or ribbons in a cloth bag or a wrapping of paper. Cover with cold water and soak for from twelve to twenty-four hours. Pour off the excess of water or rinse the gelatine to get rid of impurities and poor grades of glue which will dissolve in cold water. Place in a double cooking glue-pot and heat till melted, then thin with hot water if necessary.

Glue which is melted without soaking is not very strong.

10. Strength of glue joints. Close cellular contact is necessary. A thick layer of glue is harmful.

11. Use of glue. Have a perfect fit. Use a tooth-plane on smooth surfaces of hard wood. Use the glue when very hot. Warm the lumber to be glued if possible. Work very rapidly. Rub the air out of the joints. Clamp in the proper position with great care. Sometimes it is best to remove surplus glue with hot water and waste. Spots of glue size the wood and keep stain from "taking." Glue joints which have been broken after they have "set" should be cleaned and re-glued.

12. End and miter gluing. Size the joints and let them dry before putting together, then glue the joints together with more glue.

13. Repairing defects. Small pieces of wood may be inlaid with glue. Holes may be filled with sawdust and glue mixed.

14. Drying of glue. Joints made with hot glue usually dry hard in from twelve to twenty-four hours. Large joints fastened with cold glue take more time in drying.

15. Use fresh glue. Prepare only a small amount of glue at a time. Re-boiling glue many times weakens it. Clean the glue-pot often and prepare fresh glue.

Generalization. For woodworking glue is the best known adhesive. Cements may be used to advantage in some cases. Some of the cements are however made from glue by adding other substances. A waterproof or marine glue is made of caouchouc, shellac, and naphtha, and is used where the joint is exposed to dampness.

Application. Most of the mortise-and-tenon, dovetail, and dowel joints in furniture and cabinetwork are fastened with glue only. Where very strong joints are needed a dowel-pin, nail, or screw may be used to help in holding the parts together.

Properly fitted glue-joints are about as strong as the wood itself.

References: *Hasluck,* The Handyman's Book. Woodworking.
Noyes, Hand Work in Wood.
Park, Educational Woodkworking.

MAGAZINE CABINET 1ST YEAR HIGH SCHOOL. NEWMAN MANUAL TRAINING SCHOOL, NEW ORLEANS, LA.

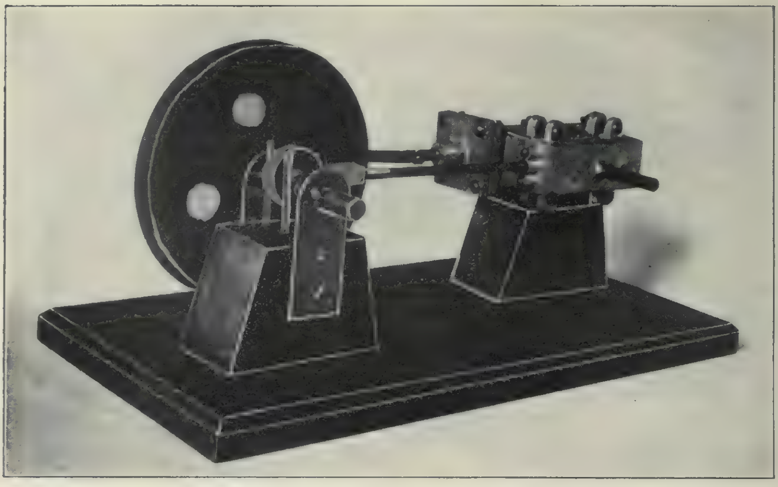


FIG. 1. A SOFT-METAL STEAM-ENGINE.

A SOFT-METAL STEAM-ENGINE.

AN EIGHTH GRADE PROBLEM FOR THE WOOD-WORKING SHOP.

WILLYS P. KENT.

ONCE there was a man engaged in making some contraption for household use; a small boy beside him said, "I could cut those sticks;" then he proved it. And the heart of the man smote within him, for he was a pedagog, and here was going to waste a chance to teach a lesson. "You saw very well," he said; "perhaps you would like to know what you are making." "What the dickens do I care what I'm making so long as I'm cutting!" was the astonishing and somewhat enlightening reply.

This is the attitude of every beginner, whether he be young or old, and it is the only possible attitude while he still is a beginner; it is the love of activity purely for its own sake, planless and purposeless; it cannot and should not last. Yet we manual training teachers are constantly striving, usually in vain, to foster this very thing by having our

pupils construct articles which from the boy standpoint are worthless; things which when completed, will not add materially to the boys' wealth or happiness, and can be used only as gifts to mother; now it is well that a boy should give gifts to his mother, but filial love is not productive of real craftsmanship; for the boy knows that his mother has neither the standards nor the critical eye of his manual training teacher. If a thinking boy is to care for perfect workmanship, that perfection must be demanded by the utility of the completed thing, not alone by the teacher, and the boy's interest in the finished product should never be lost sight of when deciding what that problem shall be.

What is the chief interest of the 8th grade boy? Certainly not taborets! Larger pieces of furniture, too difficult for him to undertake, can arouse more enthusiasm, but even an oak study chair can not be expected to appeal to a boy who loves neither study nor sitting still. Youth is essentially active, preferring a landscape to still life, basket-ball to checkers, books of adventure to those of contemplation, and toys that have moving parts to those rigidly made into one piece. This is equally true of very little children; a doll whose clothes are sewn onto it is infinitely less interesting to the child than the one that can be dressed and undressed, and many a little girl has so far overcome her mother instincts as to trepan her doll in order to find out how its eyes worked. Jumping-jacks, merry-go-rounds, windmills, waterwheels, boxes with hinged covers, folding chairs, all these are good problems for the shop, because the child's activity does not cease when the object is completed; it can still respond to his motions and its functioning period is thus greatly prolonged.

The writer once overheard the following conversation between two boys, playing among the launches drawn up on shore: "Let's look at the engine under that canvas. She's a beaut." "How do you know she is? You ain't seen her," "O all engines are beauts; come on."

THE PRIME MOVERS AS SHOP PROBLEMS.

This instinctive interest in machinery, so universal among boys, focuses in a peculiar way upon the three prime movers, steam engine, gasoline engine, and electric motor, making them, from this one view-point at least, the ideal manual training projects.

On the side of their content as subject matter these are also ideal in that they are, (1) the most important and fundamental machines; (2) that their construction involves thoroly typical and universal elements of machine construction and adjustment.

The gas engine is obviously out of the question for the elementary school. The electric motor has frequently been effectively used. But the writer believes from his experience with this steam engine that it has an even larger content for the 8th grade boy; for while more manual skill is required than is necessary for making an electric motor, steam pressure and steam parts are easier to grasp mentally than are currents and lines of force, and the action of the slide-valve and the eccentric is simpler than that of the commutator.

Considering the large number of boys who graduate from the grammar school into the workshop, it is not right for the teacher to disregard the vocational significance of the problems which he places before his classes. A course in cabinet-making can reveal to a boy his taste, or distaste, which is equally important, for a number of mechanical occupations; (a) a boy cannot complete his engine without thoroly understanding its principles—the first step in an engineer's training; (b) there is the engine's base to be made of wood and a large number of wooden molds all savoring of carpentry; (c) there is brass to be filed and sawn; there are holes to be drilled and screw-threads to be cut, all giving the feeling of the general machine-shop; (d) the soldering required gives a hint of the tin shop, while (e) pattern-making and (f) molding, with all their fascination, are constantly in the pupil's mind, and altho the usual methods of doing this work are here reversed, the underlying ideas remain. Instead of making accurate patterns, about the outside of which sand is to be pounded, the boy constructs accurate boxes, into which the metal is to be poured. Parenthetically, if the teacher is well versed in pattern-making and molding, he can so alter the process, here to be described, as to employ the regular foundry methods for the making of many of the parts.

The usual objections to a problem of this type have been concisely stated as follows:

> Such handwork is a direct outgrowth of the demands for industrial education. The work appeals to most boys, but the expense and want of facilities for carrying it out make it impracticable for most schools. ......There is little question, however, concerning its sufficiency as manual training. It offers little opportunity for a sequential study of tool processes and requires the use of many materials for work which may be termed tinkering. ......"The Teaching of Manual Arts," p. 89, Bulletin 444, University of Wisconsin.

The reply to this is that of course an 8th grade boy is a tinker; when he writes compositions he is tinkering with English; no money value can be placed on his mathematical attainments; and his taboret—

it starts out to be eighteen inches high, and ends up fourteen; the teacher, and the teacher only, demands accuracy. In the making of a steam engine the boy has less opportunity than anywhere else to be a tinker because the engine itself insists upon being well made; if the joints of the molds are not tight, the metal will run thru, and if the valve is badly adjusted, so little as the sixty-fourth of an inch, the engine will run unevenly, if at all.

It is the purpose of this paper to describe the methods by which the clumsiest of 8th grade boys, in the ordinary workshop, can make a perfectly working engine, with the additional shop expense for special tools not exceeding $5.

SPECIAL TOOLS.

Hacksaw	.35
12″ File, half-round bastard cut	.25
12″ File, flat mill bastard	.25
5″ File, warding 2d cut	.10
8″ File, round	.15
8″ File, half-round	.15
File-Brush	.12
1/16″ Drill	.05
1/8″ Drill	.07
3/16″ Drill	.10
1/4″ Drill	.13
3/8″ Drill	.21
Gas pliers	.25
Soldering salts	.32
Soldering iron	.15
Gas stove and tube	.20
3/16″ Die	.55
1/4″ Die	.55
Die-holder	.85
	4.80

MATERIAL FOR 24 PUPILS.

1″ Brass tube 1/16″ thick,	9 ft.	$2.00
1/4″ Brass tube,	3 ft.	.27
3/16″ Rod,	20 ft.	.60
1/4″ Rod,	20 ft.	.75
1 gross 1″ Round-head machine-bolts		1.00
1 gross 1/2″ Round-head machine-bolts		.75
Brass strips, 1″x3/32″,	10 ft.	1.20
Spring brass, (18 sq. in.)		.10
Solder, 30 lb., @ 28c. (or lead @ 7c, $2.10).		8.40

The time required is 40 hours which may be considerably reduced if each pupil is not required to make every mold. A well-made mold, carefully handled, may be used four or more times. Expense may be reduced by substituting lead for solder; the disadvantage being that lead is softer and dirtier and has less lustre than solder, and melts at a much higher temperature and consequently burns up the molds faster.

It will be noticed that in these directions the drawing of each part, its name, the drawing of the mold for making that part, and the description of the process are all designated by the same letter and number.

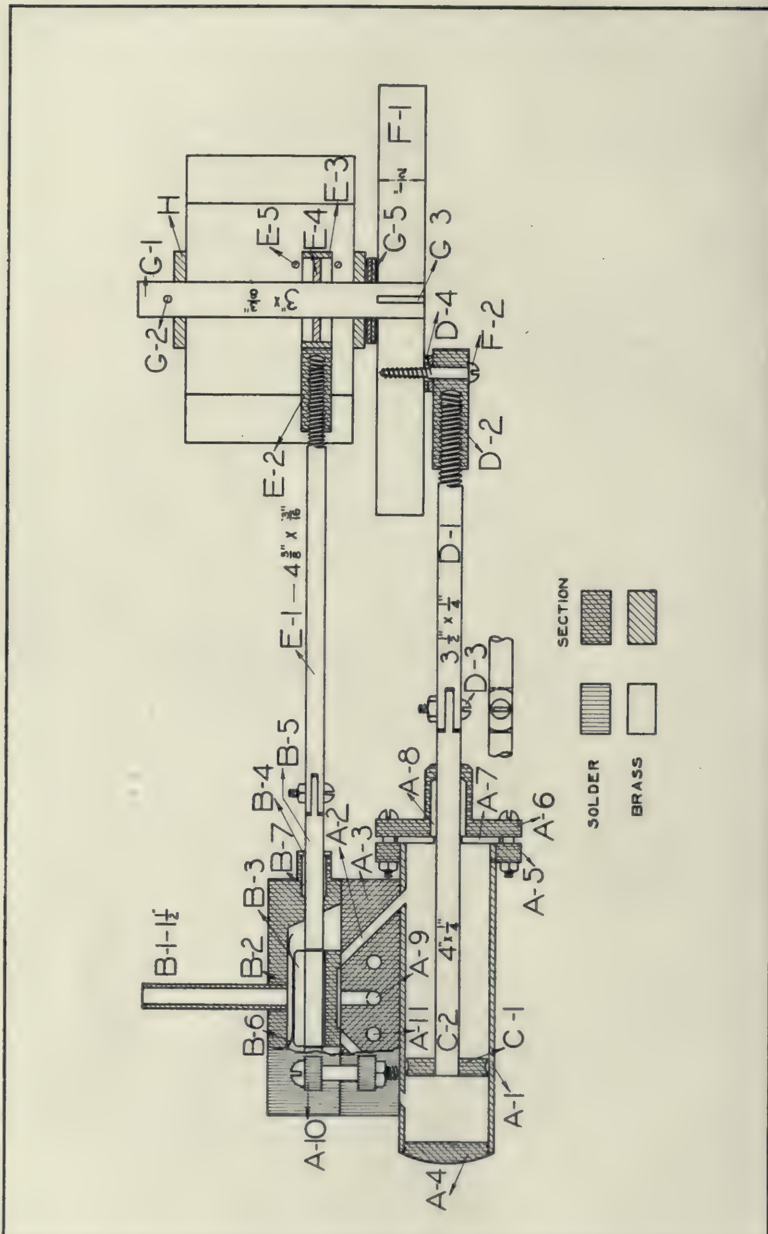


FIG. 2. SOFT-METAL STEAM-ENGINE—HORIZONTAL SECTION.

LIST OF DETAILS. SEE FIGS. 2 AND 3.

A1 Cylinder
A2 Steam Port
A3 Seat
A4 Cylinder Head
A5 Collar
A6 Cylinder Cover
A7 Gasket
A8 Stuffing Box
A9 Exhaust Port
A10 Lug
A11 Hole for Screw

B1 Steam Intake
B2 Valve-chest
B3 Slide Valve
B4 Stuffing box cover
B5 Valve-rod
B6 Valve-spring
B7 Stuffing Box

C1 Piston
C2 Piston Rod

D1 Connecting Rod
D2 Crank-pin bearing
D3 Connecting Pin
D4 Washers

E1 Eccentric-rod
E2 Eccentric Adjustment
E3 Eccentric Strap
E4 Eccentric Sheave
E5 Eccentric Guide

F1 Fly-wheel
F2 Crank-pin
F3 Balancing Weight

G1 Engine Shaft
G2 Hole for Cotter-pin
G3 Key-slot
G4 Key
G5 Washers

H Shaft bearing

I1 Base
I2 Cylinder-bed
I3 Shaft-bed

A. The Cylinder. With hack-saw cut off $3\frac{1}{2}''$ of $1''$ brass pipe, enough for cylinder and eccentric strap, E3. With file, square one end, testing with trisquare. With gage make a circle $\frac{5}{16}''$ from the end and saw, frequently turning the tube; lay aside small piece and square up the end of large piece. Drill $\frac{1}{8}''$ holes $\frac{5}{8}''$ from ends of cylinder; allowing the sides of the drill to do the cutting, tip drill toward the center until it is at an angle of 45 degrees with the cylinder. See AA2 and A1, Fig. 4. Sandpaper upper half of cylinder. Put nails AA2 thru holes; cover portion of nails now above cylinder with gum paper to keep solder from sticking.

*AA*3. *Side.* Plug up hole made by spur of bit in boring AA10; see Fig. 4. Place side and end pieces on cylinder and nail together aided by the guide lines. Look for tiny cracks. They may be stopped with string or paper. Dip feather in soldering salts or muriate of zinc, moisten the cylinder and pour the solder, melted in a ladle or large iron spoon. Allow five minutes for cooling. Do not poke nor shake it. Remove mold and take the nails from the ports with hammer or pliers. Plane surface of seat with block-plane until distance between ports=2 x length of port opening plus at least $\frac{3}{16}''$; lay a wood file on bench and draw the seat along it till its surface is true.

Midway between the ports drill $\frac{3}{16}''$ hole $\frac{1}{2}''$ deep for (AA), which meets a similar hole drilled in the side of the seat. The final

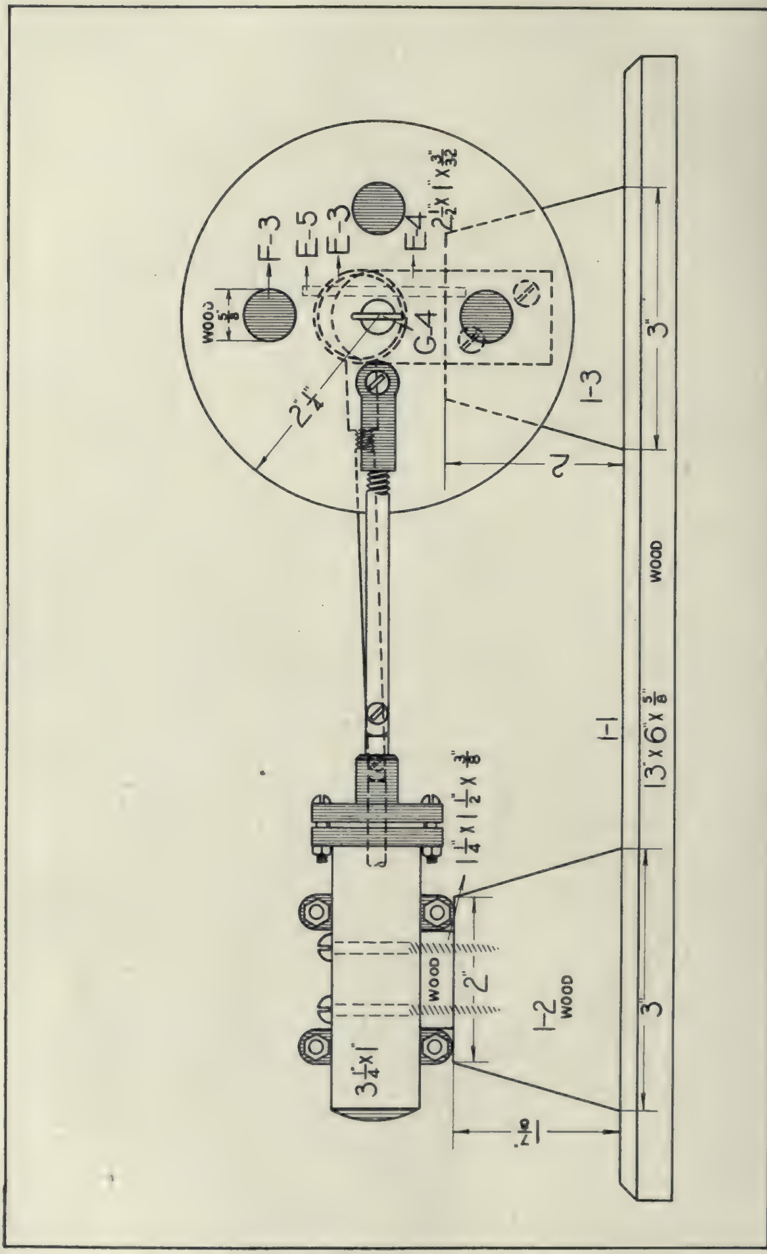


FIG. 3. A SOFT-METAL STEAM-ENGINE—SIDE VIEW.

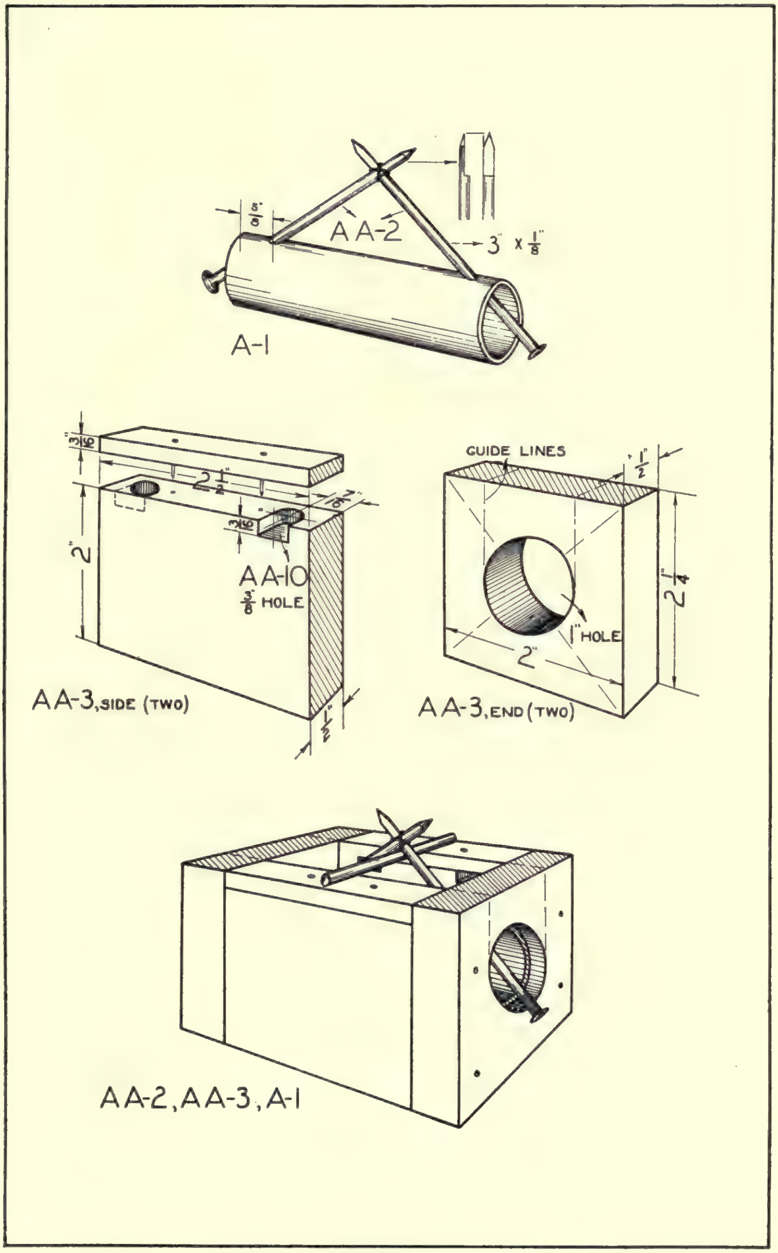


FIG. 4. DETAILS OF ENGINE.

smoothing of the seat is to be done on a float file which must be kept free from particles of solder by very frequent cleaning, with a file brush. (This, however, should not be done until one is ready to fit the valve to the ports as the seat is likely to become marred.)

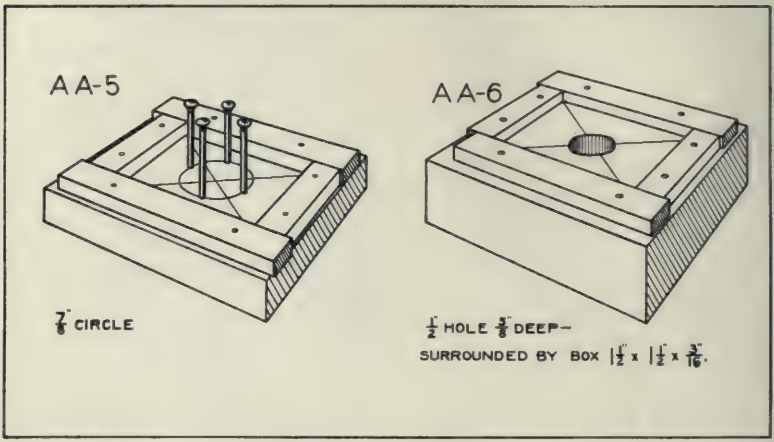


FIG. 5. DETAILS OF ENGINE.

*A*4. *Cylinder Head.* Place end of cylinder on the bench and tightly ram in a wad of paper; turn the other end up, push the wad down 1/8", clean the inside, treat with salts and pour in solder, working it in with a soldering iron; cool, and dig out the paper wad.

*A*5. *Collar.* AA5, Fig. 5, is a 1 1/2" square box, 3/16" deep. In the center is a 7/8" circle, just inside of which are driven four nails, over which the cylinder is to be placed after its outer surface at the end has been cleaned and treated with salts; the cylinder must rest tightly on the bottom of the mold so that no solder can run under; the end of cylinder must be perfectly square as the correct adjustment of cylinder cover will depend upon this.

*AA*6. *The Cylinder Cover.* The side pieces of mold AA5 can be used again. It is important to have these pieces exactly uniform in thickness; when the mold is filled to running over, place a smooth board on the heaped-up melted solder and press down, thus leveling it; any further smoothing which the cover may require can be done on the file. Drill 1/4" hole clear thru cylinder cover, from the outside in; reverse the cover and enlarge this hole by boring nearly thru with 3/8" drill, see A8, Fig. 2.

The holes for bolting the cover to the collar cannot be drilled until the piston has been made, but the method may be given here.

PACKING THE PISTON.

Thread a coarse needle with soft darning cotton and make a few winds in the slot of the piston, until it fits easily into the cylinder; then sew (overcast), with long stitches once around and test again, continuing until it fits the cylinder snugly but slides easily. Place the cylinder cover over the piston rod and clamp with two clamps to the collar. Draw piston-rod as far as it will go; make piston-rod parallel to surface of cylinder; then drill the holes at the corners. Before bolting cover to cylinder, the stuffing box must be packed; make a round pasteboard gasket, A7, Fig. 2, 1⅛″ in diameter with a ¼″ hole in the center and slip it over the piston-rod. Wind 8 or 10 coils of darning cotton loosely about piston-rod, put on cylinder cover and slip the packing into the stuffing box; do not wad it down tightly as it will cause too great friction. Oil the piston and stuffing-box and bolt the cover to the cylinder. Mark cover and collar so that they will always be put together the same way.

*CC*1. *Piston,* Fig. 7. Bore ¼″ hole until the spur of the bit appears; then turn board over and bore ⅞″ hole $\frac{3}{16}$″ deep. Treat the end of the piston-rod with salts; work in the solder with a hot iron. The groove for the packing is to be sawn with a keyhole-saw.

*BB*2. *Valve Chest.* The sides, AA3, may be turned upside down, as shown in the figure, BB2, Fig. 6, and used again. The ends used are ¾″ high and the solder may be poured in till it runs over. One end must have three holes bored in it, BB7, Fig. 8. The core, shown in BB2, may be made of wood and covered with gum paper to prevent some of the bubbling caused by the gases from the wood as it is heated by the solder; the bottom of the mold also, must be covered with paper. To prevent bubbling entirely use an iron core. This the teacher can make in a few minutes' time with file and hack-saw, and it can be used by all the class; drill a ⅛″ hole in the center of the upper side into which a nail may be thrust to hold the intake pipe in place at time of casting; also a small hole clear thru the core thru which it may be nailed to the board used for the bottom of the mold. Pure solder should be used for the valve-chest, in preference to lead or a mixture of the two.

To assemble these parts: (1) Draw on paper, placed upon the bottom board a rectangle 1″ x 2½″; (2) Nail the core in the middle

of the rectangle; (3) Nail the end piece, BB7, to the bottom board at one end of the rectangle, being sure that the holes for the stuffing-box are exactly in the middle; (4) Lay the side pieces by their respective

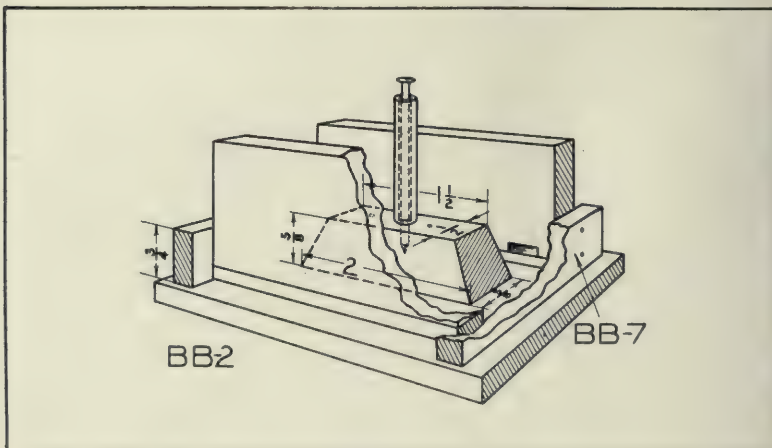


FIG. 6. DETAILS OF ENGINE.

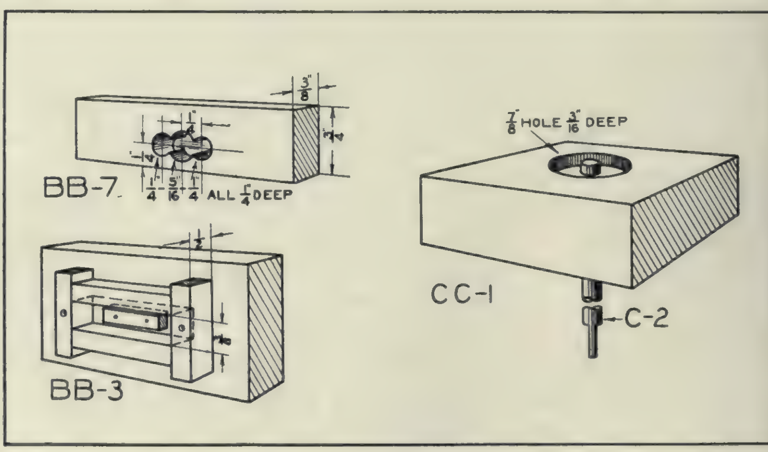


FIG. 7. DETAILS OF ENGINE.

guide lines, press the other end pieces tight against the side pieces and nail down; if all the joints are tight it may be unnecessary to nail the ends to the sides; (5) Treat the end of the intake pipe with soldering

salts and fasten into its place with a nail; (6) Pour the solder. If a wooden core is used bubbles will surely form and it will be necessary to have a very hot soldering iron ready to touch up any hole that may be left by the bubbles; (7) When cool, remove sides and ends and pick out the wooden core with a chisel, or force out the metal core by striking the nail which held the intake in place; (8) Thru the center of the stuffing-box drill a 3/16″ hole for the valve rod to pass thru; (9) Drill part way thru with a 1/4″ drill to make room for the packing; (10) In the center of the round buttress beside the stuffing-box drill 1/16″ holes into which 1/4″ No. 2 brass wood-screws may be screwed, to hold in place the thin brass cover of the stuffing-box, B4. Be careful not to break the screws off in the solder; (11) Smooth the base of the chest on the files; (12) Bore the 1/8″ holes in the lugs.

BB3. The Slide Valve. A box 1/2″ deep, 3/8″ wide. The length must be great enough to more than cover both steam ports at once, and the core, not more than 3/32″ thick, must be too short to touch both the steam ports at once. These two measurements can be corrected with knife or file so that the end of the valve may exactly fit the ports as shown, B3. Smooth valve on file and cut the slot in the top of it with a keyhole or back-saw, not with a hack-saw. Into this slot must fit the valve-rod, loosely enough to avoid the slightest binding, but tight enough so that there is no lost motion between the valve and the shoulders of the valve rod.

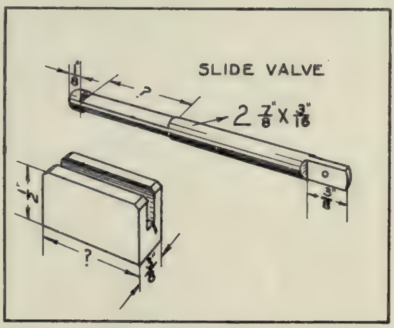


FIG. 8. SLIDE VALVE AND SIDE VIEW OF VALVE ROD.

DD2 and EE2. After the threads are cut on the rods they must be thoroly smoked with a match or candle, or it will be impossible to screw them out of the solder when it has cooled; the wedge under the rod is to keep it parallel to the base. In using these molds it will be necessary to work the solder in with a hot iron; if it be simply poured in, it will be cooled by contact with the rod and fail to reach the lower corners. The eccentric strap must, of course, be treated with salts.

E4. The Eccentric Sheave. Prepare a brass disc, of any thickness, 7/8″ in diameter. Scratch a very deep line across the disc thru the center. Measure off, on this line, a space equal to twice the length

of one steam port. Bisect the rest of the line, drill a 3/8″ hole, and put the sheave onto the engine shaft, the tighter the better; it must not be soldered until the engine is practically complete, as its proper location cannot yet be determined; but the method may be given here. Put the sheave in the right place, hold both shaft and sheave in the gas or

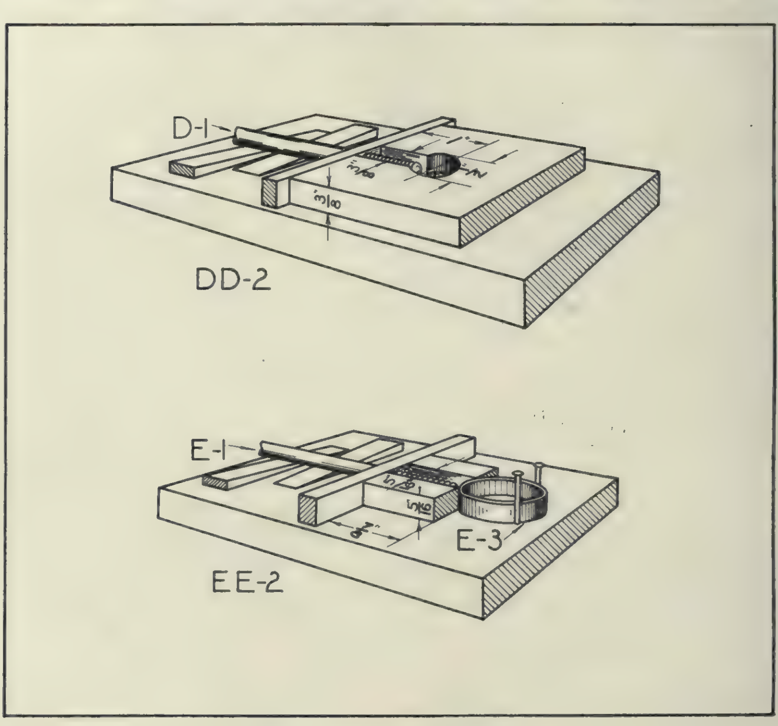


FIG. 9. DETAILS OF ENGINE.

alcohol flame and when hot, rub with a small piece of solder dipped in salts. The solder may be worked into the corners with a chip of wood wet with salts. The remaining parts are sufficiently described in the drawings.

ASSEMBLING THE ENGINE.

1. Put thin brass spring into chest, (see B6, Fig. 2), insert the valve rod, slip the valve in place, bolt chest to the cylinder, placing a thin paper gasket between if the connection is not tight.

2. Mount cylinder bed on the base, 1″ from end, 1¾″ from side, with two screws from below.

3. Screw cylinder to the bed.

4. Mount shaft, and eccentric rod on the shaft bed.

5. Put the wheel, friction tight, onto the shaft.

6. Connect piston-rod and connecting rod.

7. Place the shaft bed 1½″ from the end of the base and mark its proper position.

8. Following the line of the valve rod, determine the place for the sheave.

9. Take out the shaft and solder on the sheave, with the scratched side facing away from the wheel, so it can be seen.

10. Fasten shaft bed to base.

11. Reassemble and put in the eccentric guides, which may be brass rods or nails.

TO ADJUST THE ENGINE.

1. Hold wheel so that the piston-rod is clear out.

2. Twist the shaft until the line on the sheave is vertical.

3. Disconnect piston and valve rod.

4. Blow thru the intake while moving the valve rod, and find the position in which the ports are entirely closed, and consequently the piston will not move in either direction.

5. Make the line on the sheave vertical and screw the eccentric rod until it will just reach the valve rod.

6. Connect the eccentric rod and the piston rod and start up the engine.

A one-gallon kerosene can will serve for a boiler; if a rubber connecting tube be used, no safety valve will be necessary.

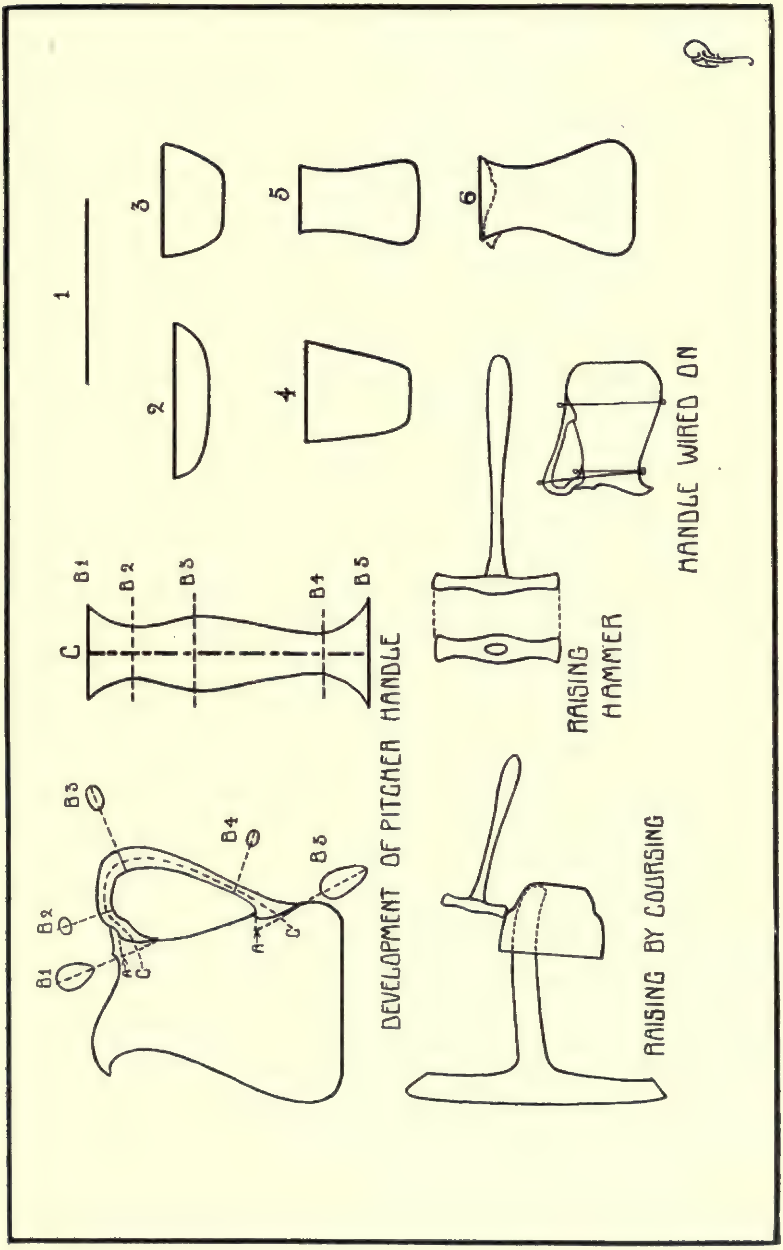
METALWORK WITH INEXPENSIVE EQUIPMENT FOR THE GRAMMAR AND HIGH SCHOOLS, IX[1].

ARTHUR F. PAYNE.

IN the issues of June and December an illustrated description was given of the simplest method of "raising a shape from the flat metal without seaming." It was stated at that time that there were three distinct methods of raising such forms. The first having been illustrated we will now proceed to a description of the second method, which is almost always used in combination with the first.

In the illustration of the two pitchers it will readily be seen that it would be impossible to raise such shapes entirely by the first method, that of beating into a hollow block from the inside, as was described for the making of bowls, etc., altho nearly one-half of the raising of the pitcher can be done by that method. The drawing will show the progressive steps taken in raising the large pitcher. No. 3 is about as far as it is possible to raise the shape by means of the first method, which we will distinguish by the trade term of "beating." With No. 4 the second method, known as "coursing," is resorted to. In this method the hammering is done entirely from the outside, with a broad faced neck hammer, and the pitcher is held on the round end of a No. 11 stake in the position shown in the drawing. It must be remembered that in "coursing" (as in any other case where the shape is being changed), the metal must be softened by annealing whenever it gets hard and does not yield to the blows of the hammer. The main object in "coursing" is to hold the metal in contact with the stake at about an inch below where the hammer is striking, and at the spot where the hammer is striking to keep the metal away from the stake, and to hammer it down to the stake thus closing in the metal and making the shape narrower. This will be understood better after a study of the drawing. The hammer blows are struck in rows all around the piece of work, starting at the bottom or where the shape starts to change, each row being about ½" higher than the preceding row until the top is reached.

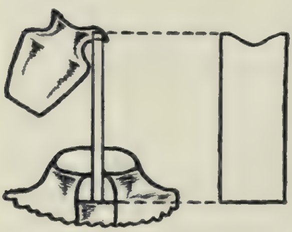
It may be seen by the drawing that there appears to be more metal in No. 6 than in No. 1. This apparent discrepancy is caused by the



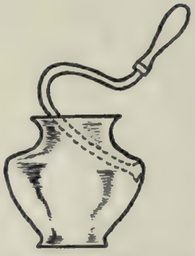
DEVELOPMENT OF PITCHER HANDLE
B1
B2
B3
B4
B5
C
1
2
3
4
5
6
RAISING HAMMER
HANDLE WIRED ON
RAISING BY COURSING

fact that the metal stretches and expands under the blows of the hammer. The amount of expansion is governed by so many factors that it is impossible to state it by any exact rule, but the approximate amount may be illustrated by the hollow handled pitcher in the first photograph. It is 7″ high and 5½″ across the base, which dimensions added together gives a total of 19½″ from one edge of the metal to the other. The pitcher was raised from a circular disk of metal 14″ in diameter. This shows that the metal stretched 5½″.

The neck of the small pitcher was formed by the "necking in" process illustrated on the bowls and jardineres in the December number.



LIPPING A PITCHER.



BELLYING HAMMER.

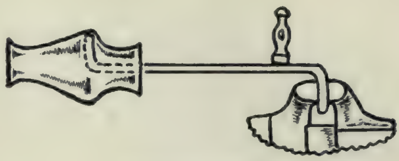
The lips of the pitchers may be easily formed by cutting the shape of the lip in the edge of a ¾″ board, fastening the board in the vise and beating the metal down into the wooden lip with the neck hammer (as shown in the drawing), thus forming the lip of the pitcher.

After the pitcher or any other similar vessel is raised to nearly the desired form, it is often found necessary or desirable to drive out some part from the inside. This can readily be done by means of a tool that is known in the trade as a "bellying hammer," which is really not a hammer at all, but merely a piece of ½″ round iron or steel slightly headed up at one end, bent into shape with a file handle placed on the other end. The shape of this tool, and the method of using it, are shown in the accompanying sketch.

Another tool that is sometimes used for the same purpose is the "snarling iron," which is a piece of ½″ round iron or steel about 16″ long with about 2″ at each end bent over at right angles in opposite directions. One end is then fastened in the vise and the other end held

PITCHER WITH WIRE HANDLE; FLUTED PITCHER WITH ONE-PIECE HOLLOW HANDLE.

firmly inside the pitcher against the spot that it is desired to drive outward, and a sharp blow is struck with the hammer on top of the snarling iron about 2″ from the vise. This will cause the snarling iron to jump and in springing back it will strike a sharp blow on the inside thus forcing out the metal. The shape of the "snarling iron," and the method of using, are shown in the accompanying sketch.



SNARLING IRON.

Three distinct types of handles are shown in the illustrations. The handle of the small pitcher in the first illustration was made by heating a piece of ¼″ round wire red hot and hammering and forging it into the desired shape, filing it true afterwards. It might be well to state here that copper can be forged, hammered, and bent while it is hot, but that brass cannot, as it will break and crumble under the blows of a hammer.

The handle of the fluted pitcher was cut out of a flat piece of 18-gage metal and the edges were lapped as described for the edges of plates and book-ends, and then bent into shape and soldered on to the pitcher. The handles of the large pitcher in the first illustration, and the handles of the silver pitcher and of the salad bowl, are known as hollow handles and are the most difficult kind to make. The handles of the salad bowl are made of two pieces, the curved inside part of the handle being one piece and the flat outside piece being soldered on after the curved piece has been hammered into shape.

The handle of the large pitcher is made of one piece of flat metal. The method of making a hollow handle out of flat metal is as follows: Make a full size outline drawing of the handle, as it is to fit on to the pitcher and sketch in the extra length on the ends as is shown by the dotted lines on the large drawings at A. Next mark on the drawing the places where the handle varies in section and draw the shape of the sections as shown at B. Next draw the dotted line C thru the middle of the handle and measure its length by spacing off with dividers or by bending a piece of wire to the shape of the line. Lay off this length, as at C, and mark the distances from the ends where the sections B were

taken. Obtain the circumference of the B sections, and lay off one-half of the circumference on each side of the corresponding section on the straight line C. Connect the ends of these lines with a freehand curve and you will have an approximate pattern of the hollow handle ready to be cut out of the flat metal. It is bent into shape by hammering with the neck hammer over a hollow in a block of wood, making the edges

TEA-POT BODY, JARDINERE, AND PITCHER, ROUGHLY RAISED TO SHAPE, READY FOR THE HANDLE AND SPOUT TO BE SOLDERED ON.

curl in towards each other, then driving them together from the outside until they touch the full length of the handle, when they should be hard soldered together. Then the handle should be filled with melted rosin or burgundy pitch and when the rosin is cold and hard the handle may

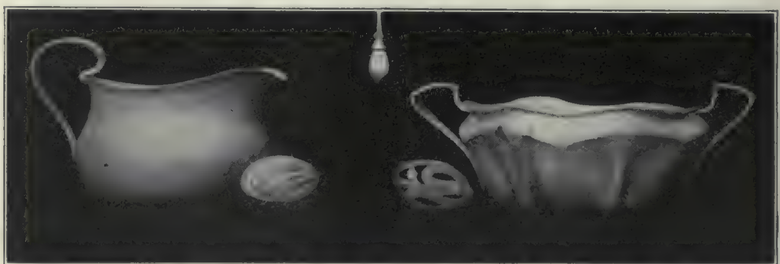
PITCHER WITH FLAT HANDLE AND BOWL.

be bent into shape with a mallet over the tee-stake and hammered smooth and the rosin melted out. It should next be fitted to the body of the

pitcher and wired on as shown in the drawing, then hard soldered into place.

SOLDERING.

The handles and spouts on such objects as kettles, tea-pots and pitchers, are usually soldered into place with hard silver solder, and should seldom be riveted, or soldered with soft solder. There are many



SILVER PITCHER AND SUGAR BOWL, WITH WIRE HANDLES.

formulas for making hard or silver solder, but that which is best for our purpose is composed approximately of silver 8 parts, copper 3 parts, spelter (zinc) 1 part. This makes an easy flowing solder for copper and brass. A fair solder for this work may be made by melting together 2 parts of silver and 1 part of high brass. Brass is made of copper and zinc, high brass having a larger percentage of zinc than low brass. Melt them together on a piece of charcoal or asbestos, it will run into a ball, and while it is still melted quickly place a flat piece of iron on it, this will flatten it out so that it may be cut into small pieces more readily.

The place where the handle or spout is to be soldered on must always be planished before the handle is tied on, because it would be very difficult to planish it after the handle is soldered on.

Hard soldering on copper and brass is easily done if you observe these three points: The joint to be soldered must be filed clean; every part of the joint and every bit of the solder must have borax on it; the work must be made red hot to cause the solder to run in to the joint. The borax mentioned is the powdered borax that can be obtained at any drug store, it must be mixed with water to the consistency of cream and applied to the joint with a small brush. The handle is tied on with fine iron wire (as shown in the sketch). The solder is cut into very small chips and placed at the joint and the heat is applied slowly until the

borax is dry then apply the full power of the blow-pipe until the solder melts and runs into the joint.

To clean the pitcher and to remove the melted borax place it for about thirty minutes in a "pickle" made up of one part sulphuric acid

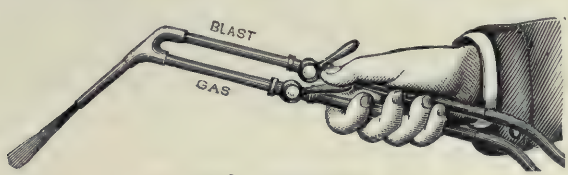
NO. 8E. BLOW-PIPE.

and two parts water. Clean it with the wire brush or emery cloth, planish smoothly all over, then color and wax as described before.

For hard soldering, annealing, and melting such as we would do in making the problems in the series, there is nothing better than the 8c blow-pipe for small work and the 8e blow-pipe for the larger work, both blow-pipes to be used in combination with the 10a foot blower. If power is convenient and more than one blow-pipe is to be operated at one time, a power blower is best. If you have no gas, a 40c gas generator is very good, or a plumber's blow-torch may be used for small work. If a large soft flame is desired an O-L No. 82 blow-torch is best and for a sharp needle flame O-L No. 29.

NO. 10A. FOOT-BLOWER.

The last two photographs are of solid silver cream pitcher sugar bowls and salt dishes, and while most of the problems described in this



NO. 8C. BLOW-PIPE.

series have been made of copper and brass, the instructions given would be the same for making the same objects in silver with this important

exception, that the annealing of silver should be done in a rather dark place so that it can easily be seen when it becomes red hot, and it should nver be heated to more than a dull red or it will be very liable to melt. Silver melts at 1830 degrees Fahr. and copper at 1995 degrees, so it will be seen that the melting point of silver is considerably lower than that of copper.

SOLID SILVER PITCHER, ONE-PIECE HOLLOW HANDLE.
From Kalo Shop, Chicago.

The feet on the salt dishes were made by melting scrap silver into little balls on a charcoal block; it is a peculiarity of metals that if a small quantity is melted on a flat surface, it will run together in the form of ball. Three balls of equal size were made and soldered with the silver solder to the bottom of the dishes, thus forming the feet.

Silver articles may be oxidized with the same sulphide of potassium solution that was given for use on copper.

Articles made of silver may be polished by hand by first using fine emery cloth. Then mix a paste of flour emery or powdered pumice with oil, and apply with the piece of emery cloth. Nearly all metals

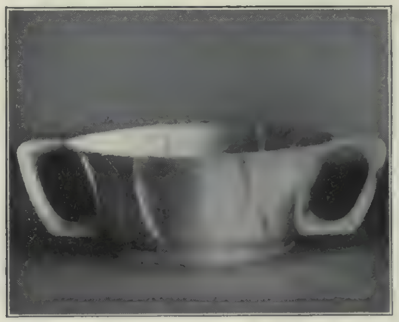
under certain conditions will form a combination with the oxygen in the air, iron rusts, forming oxide of iron, copper when heated red hot forms a black scale which peels off when it gets cold, this is black oxide of copper. Silver when it is heated to redness also forms a thin white

SILVER SUGAR BOWLS, FLUTED AND PANELED, WIRE HANDLES.

scale (designated in the trade as "fire scale"), that clings tenaciously to it. In fact whenever it is desired to remove it, it is necessary to file, scrap or polish it off, or else remove it with acid. The only reasons for mentioning it here are that, when soldering two pieces of silver together, both pieces should always be filed so as to cut thru this fire scale, otherwise they are very liable to break apart. The second reason is, that when polishing a finished piece of silver one is very liable to polish thru the fire scale and as the fire scale is of a different shade of color from the silver underneath, it makes the object look patchy in color. So it is necessary either to have all the fire scale off, or else have it all on. The old craftsmen left it all on. The modern manufacturers take it all off by dipping it in acid. For our work it is just as well and very much easier to leave it all on, so after the silver has been well polished and all the scratches and marks removed, heat it with the blow-pipe to a dull red, and when it is nearly cold place it in the sulphuric acid "pickle"

and leave it there for ten minutes, then repeat the process and the silver will be a dull white (care must be taken not to put any iron or steel in the pickle as it will turn the silver copper color). Then it should be polished lightly with the emery paste and washed off in hot water with soap and finally polished with canton flannel and powdered rouge or whiting.

This treatment will give to the silver the soft dull sheen that has added so much to the charm of the old colonial silver, and which is so much more beautiful than the hard bright glitter of the modern commercial finishes.



SILVER SALAD BOWL WITH TWO-PIECE HANDLE.

From Kalo Shop, Chicago

VOCATIONAL CONSCIOUSNESS IN MANUAL TRAINING.

Alvin E. Dodd.

MISS Blake, tall, and straight, and strong, applied for a position as assistant teacher in a settlement and got it. In less than three weeks she departed by mutual agreement, and there went on record another failure in efficiency. Some one said to her, as the list of her accomplishments lengthened, "You know a great many things." Altho she had failed, Miss Blake had a sense of humor. "Oh yes," said she, "I know how to do most anything but make a living."

What was the trouble with Miss Blake? As a girl she showed capability—potential power of success. She had ample education. In fact she had received so much education that she forgot what she was getting an education for. She wandered in pleasant fields of learning and enjoyed *herself* with emphasis on the her. And yet all the time service was her hobby and she rushed about wearing herself out doing all sorts of needless things for people who would have been better off to do them for themselves. There was no fault to find with the kind either. It was eminently *practical.* It was *work with the hands.*

She had a four-years' normal course in art, but she could not think clearly and definitely enough to teach a lesson or manage a class. So she went to a summer normal school for basketry and other craft work, to get something more practical. They were good *subjects* but it did not seem to dawn on her mind or on the mind of her teachers that *subjects* were not the important thing, and still she could not teach. She tried to be a trained nurse and was suspended for nearly killing a patient by giving the wrong medicine. That was the first lesson she ever had in the necessity for being *absolutely right.* Instead of learning the lesson, however, she gave up her course.

As a volunteer worker in settlements she was not *subject* to tests of efficiency. She cost nothing, and what she gave was all gain to the settlement. When she applied for a paid position she seemed from the variety of her record to have had valuable experience. But she had missed the most valuable experience of all—that of earning her living, or of getting into her brains the fundamental fact that by earning a living she must give return service; and the world is more and more requiring that it shall be an equal return.

Miss Blake had had schooling enough and it had been in subjects that are in demand, and it involved all the advantages of hand training. What had she failed to get? She had not learned to economize time, energy, and material. She did not know how to take care of materials; how to arrange them conveniently; how to plan her work; how and when to take the initiative, nor how to follow instructions; how to select those things which should be done accurately, and those which permitted of only relative accuracy and may be slighted. Above *all,* she had measured product alone, without regard to time consumed.

THE RELATION OF VOCATION TO ECONOMY AND SOCIAL LIFE.

All of us are familiar with failures from inefficiency. From the highest grade of work to the lowest, the inefficient are constantly being pushed down or pushed out, and from this process there results the lower standards of life, the relaxed morals, the physical and mental tragedies. For years men, and women, and children, have been crushed and killed because they could not meet the demands of industry; and industry has easily imported other laborers who would either give their vigor for gold and accept the scrap heap when there was nothing else for them, or who have been so well prepared in their own country that they could fulfill the demands made upon them here. Society was complacent with it all. Now, however, the supply of capable workers is getting short. The burden upon industry is growing heavy. The burden upon the state and private philanthropy is growing heavy.

We have tried to give relief by humane laws, and by charity, but the causes which lie deeper must be treated, not the effects. A member of the New York Bureau of Social Research writes:

> When my work first brought me directly in contact with the wage earner of our cities, I was unable for a while to see anything but the havoc wrought by poverty. I saw fathers out of work, quiescent and hopeless; mothers ekeing out a desperate and pitiful existence by knitting babies sacks or putting button-holes in shirts for some contractor or for neighboring factories; children anemic, ambitionless, already handicapped . . . . Better wages, it seemed to me, was the absolute necessity. People should be paid more for their ten, twelve, or fourteen hours a day. They were giving, however inefficiently, most of their waking hours to their work, and it seemed to me, they deserved for it a higher percentage of the profits which their work brought in to their employers.
>
> Since then, however, I have come to think that our point of attack ought to be changed. Social responsibility goes farther back than the giving of wages. It must go back to the giving of an education . . . . We must not

disturb the balance of justice between different grades of workers by obscuring the relation between the job done and the pay earned . . . . The leverage for uplifting the workers must lie *in the efficiency* of the individuals themselves, not in the mechanical compulsion of outer forces.

Better pay is a weapon against the bitterest manifestations of poverty, and industrial training is necessary that workers may secure this better pay, but beyond this lies a social reason for industrial education. Essential as such education is on economic grounds, it is equally so on grounds of social necessity. We have been dealing with the forces making for disintegration; unskilled individuals, pressure for mechanical speed, racial misunderstanding, group antagonisms, distrust between employer and employe, consumer and producer. The *first* step to check this social disintegration, to promote a better working together, is to substitute trust for distrust. Of course this one thing alone cannot achieve this end, but it will help marvellously toward that achievement. While many artificial causes have accentuated the situation, the instability of employes has antagonized employers, and the inefficiency which is at the basis of this instability has made the employes ready to take offense themselves. These employes, to get at the root of their difficulties, need to be developed into self-sufficient, self-sustaining human units, spiritually alive. They need to be educated industrially, not only that they may be efficient "hands," but that they may be intelligent men.

Says Mr. James P. Munroe:

Industrial education will have a tremendous effect upon the relations between employer and employe. For when both (so-called), capital and labor shall have been trained in a school atmosphere in which industrial education plays a large part, they will then understand their common problems far better than they do now, and the present conflicts, which arise in almost every instance simply from misunderstanding, will be done away with. Both sides in the present controversies rarely appreciate what modern industry, in all its breadth and social significance actually means.

We are facing today poverty, disease, overstrain, over-employment, under-employment, idleness, and non-employment among many classes of our workers; and among employers, complaint of scarcity and inefficiency of labor; and between these two forces every sort of distrust, antagonism and hatred. The country is hindered in progress by lack of efficient people, and the burden of those who are partly or wholly inefficient. Society needs the efficient service of every member, and every member, for his own sake, needs to meet this demand of society.

It is becoming increasingly evident that the ability of every individual to earn a living is of primary importance to society as well as to the individual. Therefore the economic and social laws that lie back of this fact should be studied and understood by every teacher of manual

work. When consciously or unconsciously he brings into his work a background which only such knowledge can give, we will see that a new motive force will have found its way into the school.

THE DEMAND FOR BREAD AND BUTTER EDUCATION.

America has been proud of its schools, perhaps a little conceited. We have had free education and we have had prosperity. Therefore, what was clearer than that the little red schoolhouse, and its successor, the big granite schoolhouse were responsible for this success? But there has come about a growing consciousness that many of the people who have produced this prosperity did not go to our schools at all, many others went very little; others felt that they got their most valuable lessons outside of the school.

In the 70's and 80's the need for competent workers in industry gave rise to a demand for industrial education; as a result we have today drawing and manual training in our public schools almost universally.

As one turns back the pages of N. E. A. reports to twenty or thirty years ago, the appeals for industrial education sound peculiarly like those ringing in our ears today. The manual training movement does not, however, seem to have satisfied the demands made years ago, and the old arguments are being again brought out and sounded, only this time we are working the new term "vocational."

Does the use of this term infer that manual training is useless and is to be discarded for something new? I do not think so; but that manual training work formulated in obedience to a logical theory of the subject has shed little light on the industrial environment, and those who have studied its history realize that it has not been allowed to measure up to what its advocates originally hoped for it.

During the past year the growing popularity of the term "vocational" in educational discussions, like the term "efficiency" and "scientific management," gives promise of becoming almost as overworked as was the word "strenuous" after it was put forth by a recent popular president. But they are good words, all of them, and valuable as catch words to which we may tie the ideas or movements they represent. Society has a way of reducing its significant movements to lowest terms and generally this lowest term is some "pat" catch word or phrase that carries the idea.

Vocational education is defined by the legislature of Massachusetts as "Any education whose controlling purpose is to fit for profitable

employment." This is coming to mean, specifically, to fit for vocations, more or less specialized, according to circumstances; usually industrial, sometimes commercial. It is assumed that the professions are provided for.

But from the attempt to teach specific vocations or groups of vocations there is bound to come a wholesome reacting influence upon manual training, and indeed all education, for that matter, for both teacher and pupil are brought into a livelier interest, into a more vital understanding of the industrial and commercial world and from this coordination will learn valuable lessons.

TECHNICAL KNOWLEDGE ONLY ONE OF THE ELEMENTS OF VOCATIONAL EFFICIENCY.

It will probably be found, for example, that the demand for vocational training is really, a demand for general efficiency, and general efficiency does not depend wholly upon training for specific jobs; indeed it is by no means always produced by vocational training, as our commercial and professional schools prove. Miss Blake had had vocational training for the profession of teaching and yet lacked the most fundamental elements of real efficiency.

It will be found that efficiency of the individual laborer in whatever line involves: (1) Health, physical strength, endurance; (2) Reliability, economy (of time and material); (3) Imagination, initiative, intelligence, judgment; (4) Ambition, energy, perseverance; (5) Mechanical ingenuity; (6) And lastly technical knowledge.

Technical knowledge—which is much of the business of the vocational school—can be more readily acquired "in the job" than any of the others. Industrial concerns very often prefer to train their own workmen. The other requirements I have just mentioned, however, are indispensable, as factors of efficiency in any vocation. Does it not at once appear that the teaching of these indispensable things should not be confined to vocational training as a new subject?

As a matter of fact, our schools have done much to encourage the opposite of each one of these other necessary elements of industrial efficiency. While the case of Miss Blake is exaggerated, it is none the less typical. A bright alert boy, who knows enough to know what to do next and does it, may get a black mark for taking his geography from his desk before the teacher tells him to, but the boy who goes into an office and, after becoming familiar with the work, waits to be told what to do will soon get his walking papers. A teacher may give a good

mark for ability when a child carefully draws an ellipse when he was asked to draw a circle, but a nurse who substitutes a hot-water bag when told to use an electric pad loses her place.

In our schools, we find every variety of subject introduced and every sort of method used. There is not even time to enumerate them, they are so many. And yet complaints come back that the children leave fifth and sixth grades and go to work without showing adaptability for any sort of a job. That is true, it is whispered, of even college graduates. The question has arisen as to whether an education is really a desirable thing or not. Many get an education—so called—and fail, and many do without one and succeed. People who did not dare blame the schools have said it was luck.

Dick was always in disgrace in school. He never knew his lesson, tho to be sure he knew a good many things that weren't in the school books. He refused to analyze the mental problems when he could give the answers right off. Nobody thought he did them. He must have cribbed the answer. Anyway he would not answer as the teacher told him he must answer, so he was given a low mark. The class was having a lesson in writing the letter *i*. The teacher counted for the class, up slide, down slide, up, and a dot. This particular Dick I knew about was sent home for telling the teacher he would not do that. When it was time to write he felt the thing to do was to write—as he could do, better than the rest of the boys—but the teacher thought he should take position and write by count. He was fond of making experiments, mechanical and psychological, in the school; the reactions he got from the teacher proved him a practical psychologist, but unfortunately that was not in the course of study. At the end of the year he lost his promotion and left school. We were sorry at the time to see him fail but now he is better off than any of us!

Now, was it luck? Or was it success honestly won by the very qualities which the school did not have the insight to appreciate?

THE EFFORT TO SECURE EFFICIENCY.

A workman may do a good piece of work, but if he is slow and puttering about it, he is not wanted. In the factory there is no time to putter. I am not advocating speed in industry. There is a great outcry against speed in industry, but speed does not necessarily mean strain. It should mean merely eliminating needless movements. If any one doubts what this can accomplish let him read "The Principles of Scientific Management." It was for a contracting firm in Boston that F. W. Taylor of Philadelphia made his study in bricklaying—only one of many studies in efficiency equally remarkable.

The number of distinct movements from picking a brick from the pile to making it a part of the finished wall was found to be eighteen.

These were reduced to five and, with no more physical effort, the men increased their capacity in the number of bricks laid in a day from 1,000 to 3,000.

Nobody has had to take note of such things in the past. Competition was great, and life was relatively simple. But as industry was speeded up and social duties multiplied, men and women slept fewer hours, and "speeded up" more during waking hours. They did not think to stop doing needless things.

In turning to the schools one natrually finds them reflecting the situation prevailing in society at large. The schools have not had to teach for efficiency in a life work. Efficiency has not been wholly necessary to reasonable success. We had ample natural resources, an ample foreign labor supply, and a prosperous nation. Now, however, efficiency is called for and the schools are trying to find a way to produce it. Pupils are shortening their time of preparation. The school, must not only *produce* efficient people, it must *be* efficient. It must do its work in less time, with less wasted money, (think of the waste for retarded children alone) and with less wasted human effort of teacher and pupil. Here let me venture the prophesy that in *being* efficient it will do more toward preparing its pupils for efficiency than in any other way.

School teachers have not had to compete with any other class of people, they have enjoyed the reputation of being right, they have been in a position to require perfect acquiescence. Teachers have established a world of tradition, with methods and aims of their own, instead of considering the life, the methods, and the aims of the whole world as their affair to be studied and imitated and interpreted to their children.

One example: A young woman applied for a position in a large magazine publishing house. She had been educated in a good seminary and had graduated with a good record from an excellent normal school. She taught for a time, receiving the highest salary paid in rural schools in Massachusetts, $12-$14 a week. Circumstances led her to desire a change and so she made the application. She was willing to begin with addressing envelopes. The manager kindly told her that teachers were the most unpromising applicants. They were poor penmen, slow and inaccurate, and always thought they knew best what to do and so were unwilling to follow instructions. It was not that she lacked technical training in clerical work, but that the habits formed in the schoolroom were not the habits that could be tolerated in this business house.

Here, it seems to me is the clue to the whole situation. It is not vocational subjects which make a course of study function vocationally, but a vocational method, the development of vocational habits, or efficiency habits. A course of study in woodwork, metalwork, forging, what not, may come just as far short of being vocational as a course in history. Whatever the pupil is set to do, he should be taught to do right by industrial standards, with the least possible waste of time and effort.

The real demands of the world are, then: (1) Social efficiency; (2) As a means to social efficiency, economic efficiency; (3) As a means to economic efficiency, vocational efficiency; hence, (4) Education measured by efficiency tests according to the standards of life not of the unreal world of the school.

THE NEW DAY FOR MANUAL TRAINING.

As Mr. Gustafson says: "The public schools must increasingly train for vocations; that is inevitable. The great task of the public schools from now on will be to coordinate, as never before, with the industrial and commercial life of the community, as well as with the intellectual. They must give their pupils an equipment and a training that will be of use to them in earning a livelihood, as well as in the enjoyment of such leisure as may fall to their lot.

"It is quite clear that a developed form of manual training should be made a much more important introduction to the practical activities of wage earning life. When such work is supplemented by a proper amount of vocational information, and guidance from the teacher, the results will have an infinitely more valuable bearing on both choice of occupation and future vocational training."

If this is to be done, we must have what I have termed vocational consciousness in the manual training teacher. He must see more clearly what relation his presence in the school has to social and economic movements which have brought him there. In other words vocational education is manual training "plus," and in the preparation for this next step there is to be seen the dawn of a great opportunity for the teachers of manual training, because manual training is the natural basis upon which to build up a large and important section of vocational work.

If we can extend manual training, itensify it, rearrange its content, so that it will teach our boys and girls the fundamental and essential processes that enter into all industry, and if we can, in the later grammar grades and the earlier high school grades supplement this training by

intensive vocational training in groups of allied trades, rather than in individual trades, we shall have gone far to bring about the thing we are seeking. It is possible, I believe, in woodworking, for instance, to give to boys such advanced practical and theoretical courses in the operations which are common to carpentry, pattern-making, and cabinet-making, as will fit them to enter any one of the three with what we may call advanced standing. He will not, of course, be a competent carpenter, pattern-maker or cabinet-maker, without further specialization either in a trade school or in the trade itself, but he will have made a good beginning in all three. He will, moreover, have chosen only a group of trades instead of a special trade, and will have gained the inestimable advantage of delaying his choice of a specific vocation until he has arrived at some degree of maturity. And in this choice, the important thing is to learn to use both hand and machine, where each is of the greatest advantage, and while using it, to use it right, and how to know in any work what the right way is. Speed, as attained by the piece worker, may not be taught properly for lack of repetition, but the element of speed devoid of strain and waste may be taught by a teacher in school, as it is by efficiency foremen in scientifically managed shops. And pupils for whom, by reason of later occupation, the manual training is not vocational in the strict sense, will yet find it to be vocational in a very real sense if it instils the qualities and habits of efficiency as measured by the industrial world. And if the pupil learns to realize such things he will have a fair show for success in any work he is obliged to take up without a teacher.

Vocational consciousness, or efficiency consciousness, will determine both content and method. It will be found that the vocational value of manual training will depend more upon the method than upon the content of the work, and this method will result from the vocational consciousness, or as I just stated, the efficiency consciousness of the teacher.

That, certainly, is vocational which prepares a pupil to go out and do what is required of him in a specific job, let the job be in a trade school or in a shop. Such preparation consists in learning to be exact, to act promptly, to follow instructions, to be honest, faithful, and reliable, to know the worth of time and material. Well for his progress and his happiness, if he has also learned the broader relationships of life.

One of the first things on which manual training teachers may begin in an effort to produce some of these results, is to consider the condition of the tools in the shop in every criticism that is made on a boy's work.

Above all the teacher must teach the relation between cost in time and material and upkeep of establishment, and value of product. There should be in the schoolroom the same atmosphere of success and efficiency as prevades the best places of business. At times this should be explained to the pupil, so that he may realize that somebody pays for every waste and that society cannot have waste in its public institutions any more than a business man can have it in his factory.

In the school with which I am most familiar a very effective arrangement has been made in the establishment of a toolroom such as is found in all factories and technical college shops. Class members serve in rotation in checking out tools and certain supplies. The study of shop operation in regard to care and handling of tools has had a more marked effect on these young boys than anybody anticipated.

In some manual training shops there have been attempts made to have the boys keep time and cost sheets, but very rarely have I seen these sheets kept accurately or used for critical comparison in a way that brought to the pupil a consciousness of his efficiency or lack of it.

MANUAL TRAINING TEACHERS PIONEERS STILL.

There is great opportunity for teachers of manual training to blaze a trail. There are signs of early travelers here and there, but for the most part they have kept in the beaten road. There will be found few guides. Rather it is for the teachers to guide others. Out of their own initiative they will make a way. No one can tell them how to do it. No stereotyped method will serve. There must be developed a method out of the consciousness of human need, out of what I have called a vocational consciousness.

To sum up—having recognized the relation of vocation to social and economic wellbeing, the relation of efficiency to vocation, and the mental, physical and mechanical elements of efficiency, the manual training teacher will find a way to instruct his pupils thru natural expression of his own consciousness.

STANDARDIZING SEVENTH AND EIGHTH GRADE MANUAL TRAINING.

A. P. Laughlin.

IN Peoria we have nineteen grade schools and twelve different men teaching seventh and eighth grade manual training. Some of these men have been teaching the subject fifteen years and were the promoters and organizers of the work in their respective schools, while others are just taking up the problem. Naturally all have their own ideas and ideals. Some are strict disciplinarians, long on joints and tool practice, while others have frankly said that they considered the shop more as a boys' club house, an extension of the play ground, a place where the boy could learn some things for himself and not because the book or the teacher said it was so and so.

Under such conditions the boys came to the high school with widely differing attainments and ideals and because some had learned every thing from the beginning for themselves and very little from authority, the work in the high school proceeded under great difficulties.

We all recognized the situation but it was hard in the face of clamorous students, teachers, and parents, who failed to see the defects of the system, to change matters. Many lengthy and strenuous conferences were held before the following plan took shape, was agreed upon and tried out. There was nothing radical. It was rather a composite—a selection of the best in our practice, and an elimination of the undesirable.

A PLAN OF ACTION.

We decided: 1st. That a boy should really know something definite when he left the 7th grade and that, if he could do more than the minimum amount, it should be rather in the perfecting of technic in the 7th grade field than a going on to new territory.

2d. That everything made should be so presented as to appeal to the boy as worth doing from his point of view.

3d. That we would surely keep the work within the reach of the average boy of the grade.

4th. That we would so grade the difficulties of the work presented

as to ensure success, concentrating attention upon one difficulty at a time and mastering it sufficiently to make the next step possible.

5th. That the 7th grade field should be large enough to make possible the construction of simple furniture or articles involving the fastening together of several pieces of wood.

With these ideas in mind we set down the following operations to be taught, and in a sense mastered, in the 7th grade.

SEVENTH GRADE SCHEDULES OF OPERATIONS.

1. How to measure accurately.
2. How to square lines accurately.
3. How to gage lines accurately.
4. How to read simple mechanical drawings.
5. How to make full size mechanical drawings.
6. How to make scale drawings.
7. How to sharpen the plane.
8. How to adjust the plane.
9. The rules for planing.
10. The use of the cross-cut saw.
11. The use of the rip-saw.
12. Chamfering.
13. Boring holes.
14. Nailing.
15. Fastening with screws.
16. Making duplicate parts.
17. Scraping.
18. Sandpapering.
19. Staining.
20. Filling.
21. Finishing with wax.

This is rather a long list but it only emphasizes the fact that there are many pitfalls in the path of the inexperienced, and that we only invite failure by ignoring them. On the other hand the list is rather noteworthy because of what it omits; e. g., gaining, notches, mortise-and-tenon, the miter, and indeed, all joints except the "butt" joint.

The ability to measure, gage, and square lines accurately is so essential that we furnished prepared stock upon which to practice these fundamental operations, and we found that by concentrating the attention upon each one of these processes in turn that all could (with a little extra attention to the backward ones), really master these processes, and there was no lack of interest for all could see that success on future projects depended upon a mastery of these first steps.

We next turned our attention to drawing. We first drilled the boys upon reading drawings displayed upon the board. Then we had them copy, full size, a drawing of the first type problem that would

FIG. 1. CUTTING BOARD, SWING BOARD, AND TIE RACK.

involve an understanding of most of the processes to be learned. We did not all select the same problem but the operations or processes involved were the same. Some of the teachers used a cutting board, others a swing board, and still others a tie rack. The drawing and making of any one of these problems involves an understanding of operations 1, 2, 3, 4, 5, 7, 8, 9, 12, 13, 18, 19, and 21. (Those who used the cutting board illustrated operations 19, 20 and 21 as a separate exercise.)

The instruction sheet for one of these type problems is presented herewith, together with photograph and drawings of all three.

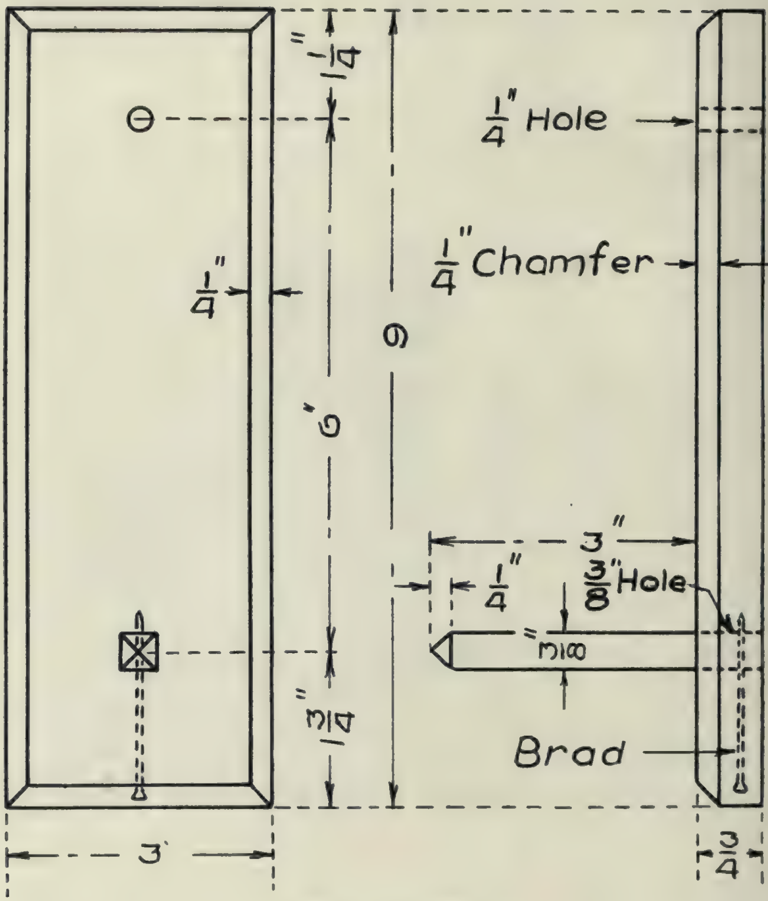


FIG. 2. TIE RACK.

INSTRUCTION SHEET FOR TIE RACK. NO. 1.

A. Drawing.

1. Place the paper upon the board so that the top edge is parallel with the upper edge of the Tee-square.

2. Draw border line 1″ from edge.

3. Print title, scale, date, and name as shown on board.

4. Draw front and edge views as shown on board, using Tee-square to make horizontal lines and Tee-square and triangle to make vertical lines.

Note: Make all lines very lightly and indefinite in length.

5. Show to teacher.

6. Go over the outlines with a good firm line.

7. Put in the dimension lines, arrow points, and dimensions as shown on board.

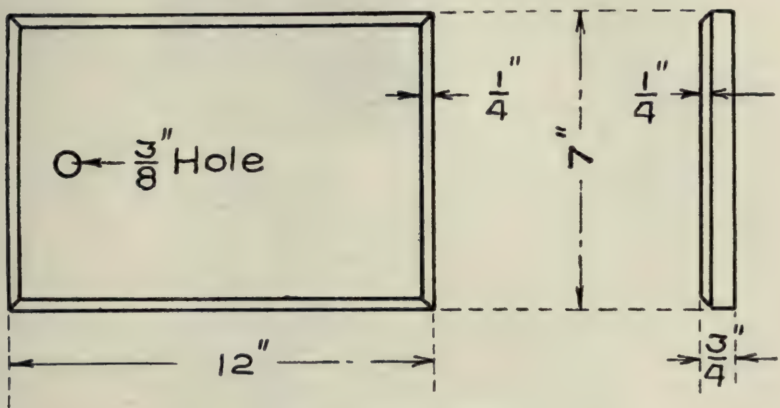


FIG. 3. CUTTING BOARD.

8. Show to teacher.

B. Construction.

1. Take your plane apart.

2. Sharpen the plane-iron on the oilstone, whetting on the beveled side until you turn up a slight burr.

3. Turn the burr by holding the plane-iron flat down on the flat side.

4. Whet back and forth until the burr is all removed.

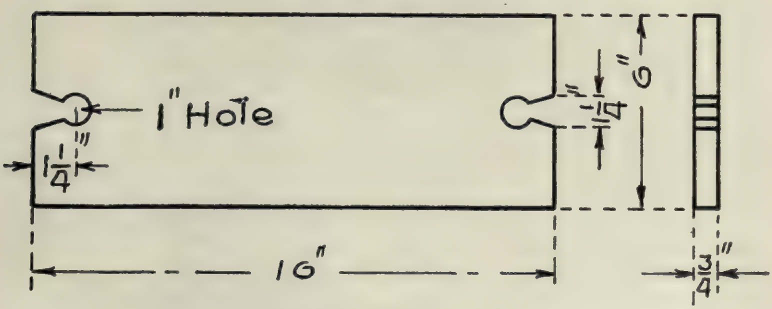


FIG. 4. SWING BOARD.

5. See that the edge is slightly crowning (about 1/64″ to 1/32″).

6. Put your plane together and adjust until you can take a very thin shaving that is thicker in the center than at the edges.

7. Plane up the body of the rack following the order of steps indicated below.

FIG. 5. FOOT STOOL, TABOURETTE, MAGAZINE RACK, AND WASTE BASKET.

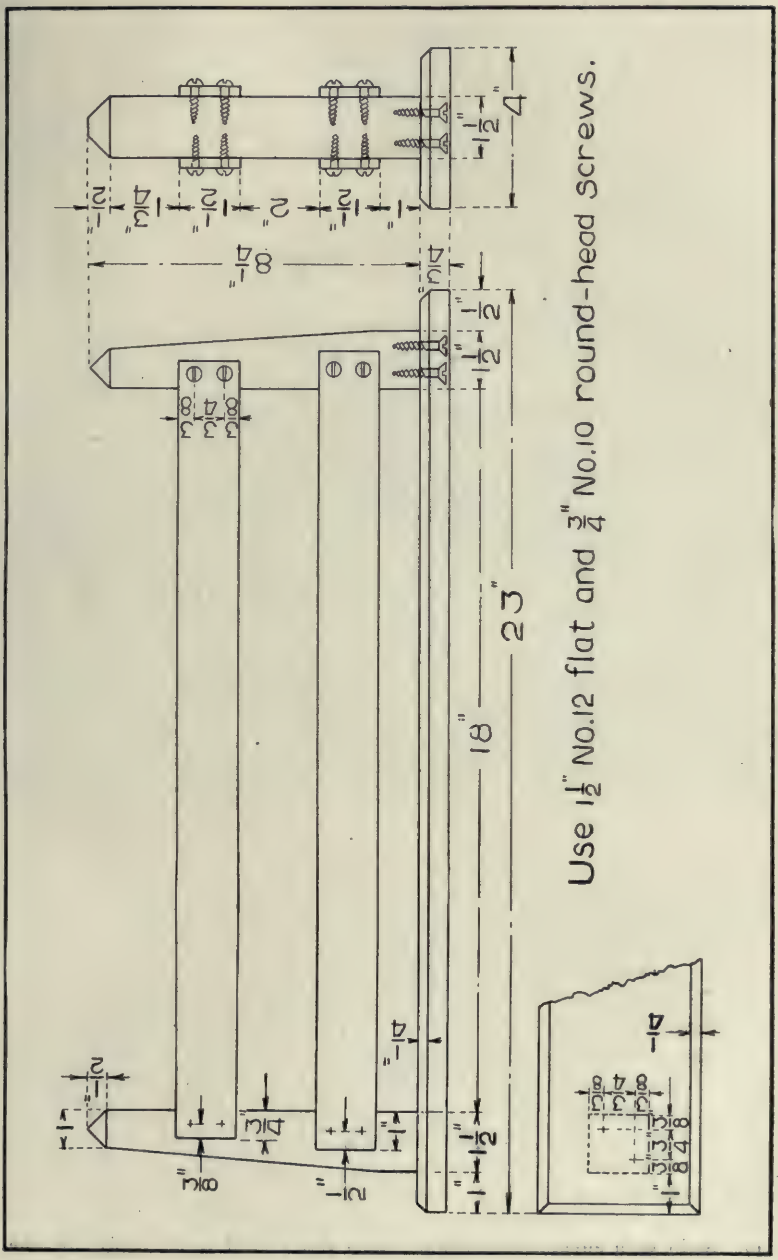


FIG. 6. MAGAZINE RACK.

(a) Face side, put on reference mark.
(b) Joint edge, put on reference mark, and show to teacher.
(c) Gage and plane to width, and show to teacher.
(d) Gage and plane to thickness.
(e) Square one end, and show to teacher.
(f) Measure length, and square around.
(g) Cut off and square the other end, and show to teacher.

FIG. 7A. SUPPLEMENTARY PROJECTS FOR SEVENTH GRADE.

8. Mark the chamfer with a pencil line.
9. Lay out the centers for the holes.
10. Show to teacher.
11. Plane the chamfer.
12. Bore the holes.
13. Sandpaper to real surface.
14. Show to teacher.
15. Cut and fit the pin in place, leaving it long.
16. Show to teacher.
17. Fasten the pin in place with a brad.
18. Cut to length, and trim the end to the shape shown on drawing.
19. Stain with either mahogany or green water color stain, wiping off the excess at once.

20. When dry sandpaper with No. 0 sandpaper.
21. Stain a second time or even the color with a damp cloth.
22. When dry, wax and polish.

The things insisted upon here were:

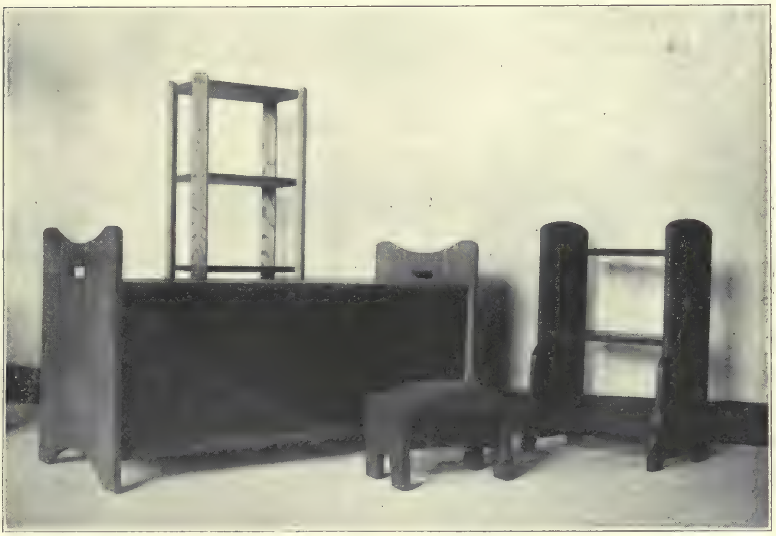


FIG. 7B. SUPPLEMENTARY PROJECTS FOR SEVENTH GRADE.

1st. A drawing that told the facts that must be known in order to make the project.

2d. The correct whetting (the irons were ground) and adjusting of the plane-iron.

3d. The following of the correct order in the planing of the surface.

4th. The planing of the opposite edges parrallel and square with the face side.

5th. The sandpapering of the work to real surfaces.

The second type problem required the bringing together of several parts into one finished piece and the fastening of them together with screws. Here again we did not all use the same model. Fig. 5, shows the models that proved most satisfactory. They all cover the field as outlined for the grade, and on the other hand they do not reach outside of it. They appeal to the boy as worth while for the boys seldom fail to pay for the stock used altho they are not required to do so unless they wish to take the piece home. And lastly they are within the reach of the average 7th grade boy.

Fig. 6, shows the drawing for one of these type problems.

Having thus completed the course of study as outlined for the grade, the students were encouraged to design some project observing the limitations set by the 7th grade field. The designing usually consisted merely in changing the dimensions of some article so as to better meet the individual needs of the student or in eliminating certain joints that he was not yet allowed to incorporate in his work. Figs. 7a and 7b show some of the projects designed and made under the limitations of the 7th grade field.

FIG. 8. FOOT STOOL FOR EIGHTH GRADE.

We pass now to the work of the 8th grade. The new processes here added were:

ADDED PROCESSES IN EIGHTH GRADE.

22. Grinding and sharpening chisel.
23. Paring with chisel.
24. Dado, lap, or gain joints.
25. Accurate sawing.
26. Form work.

Here again a type problem was selected and all in the class were required to work it thru and to master, so far as possible, the processes involved. Figs. 8 and 9 show the project that most of our teachers selected.

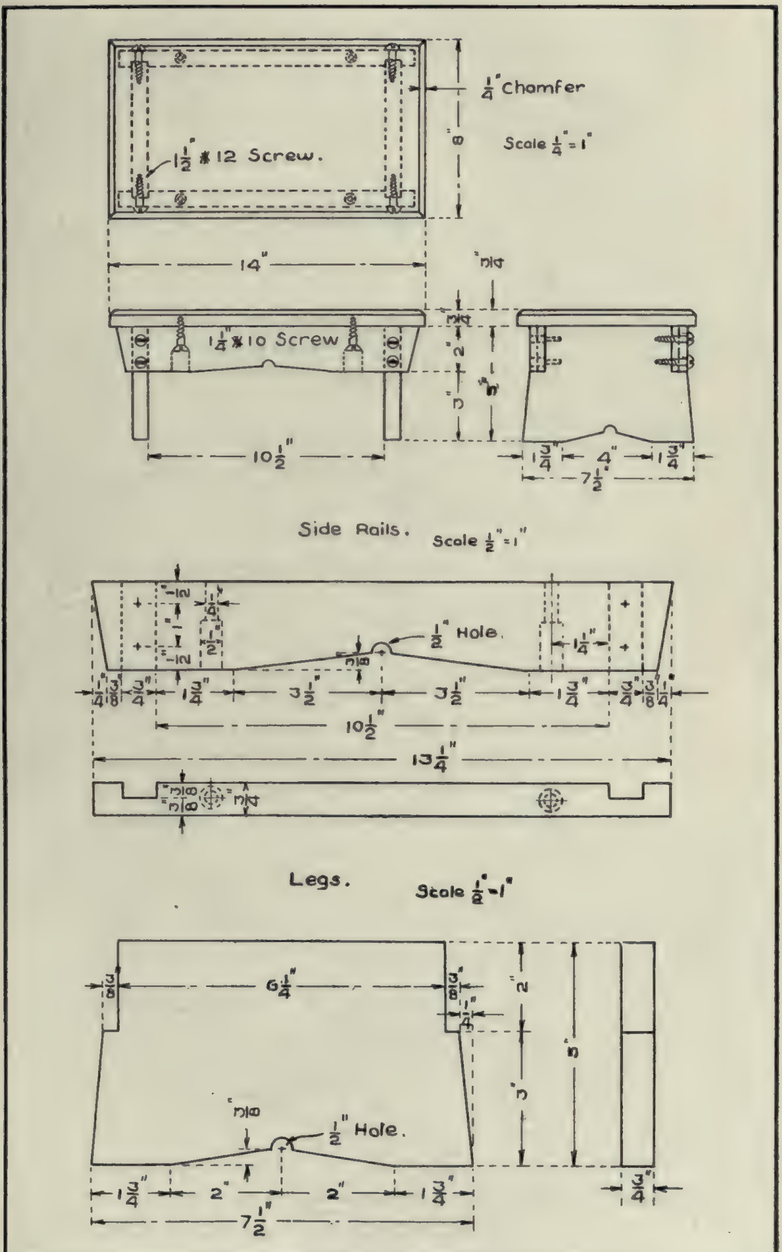


FIG. 9. FOOT STOOL.

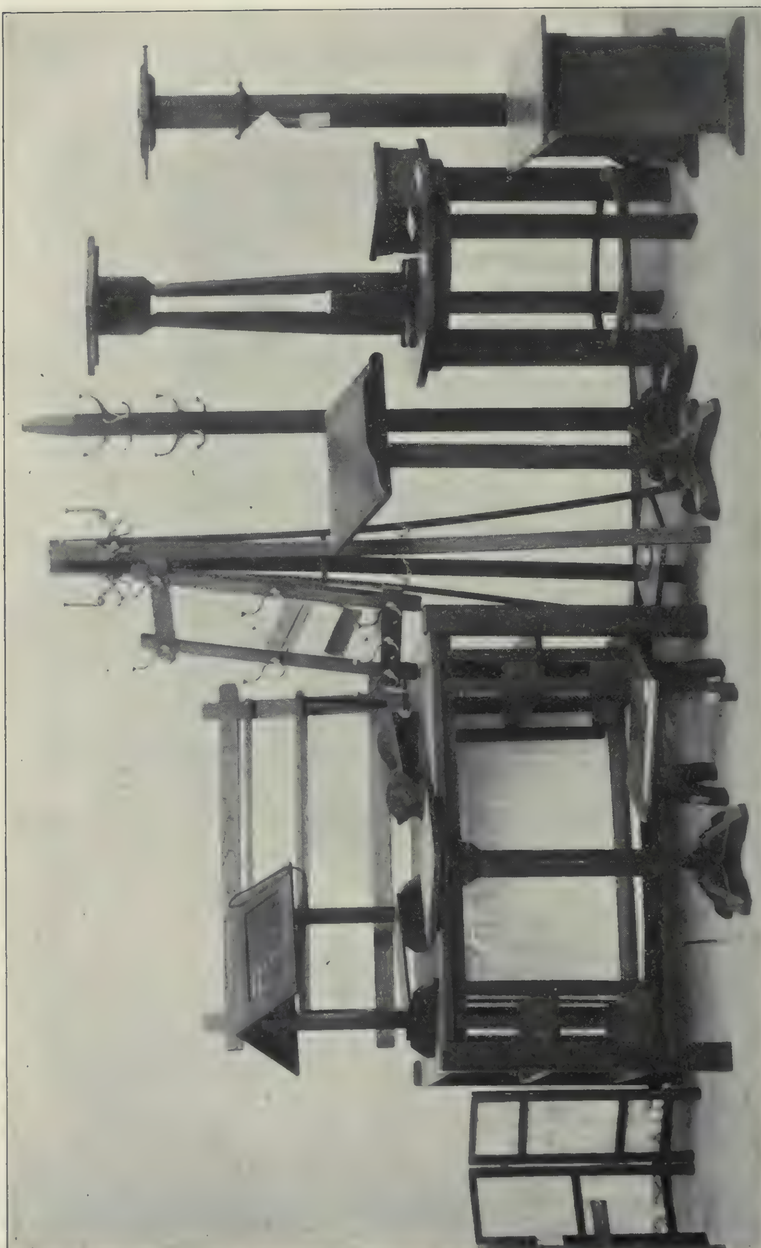
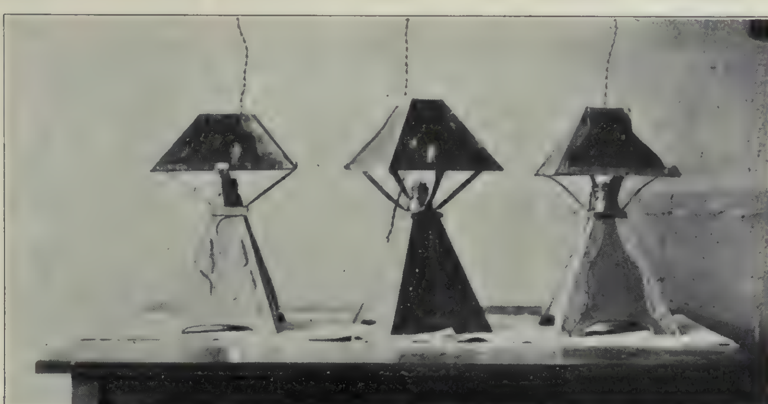


FIG. 10. FURNITURE MADE IN EIGHTH GRADE SHOP WORK.

After finishing this problem, each pupil selected or designed a project (or projects if time permitted), that involved no new principles. Fig. 10 shows some of the attractive pieces that can be made and not overstep the limitations set by this 8th grade field.

No doubt some of these models are open to criticism, but at least they are the work of real boys working under real school conditions. Some of the larger pieces were made by boys of unusual ability and the teachers often allowed such boys to work over time but none of the problems overstep the limitations set for the grade. By following this plan something fresh and new is reserved for the high school and we are sure that most of our boys know at least that there are certain methods that constitute good practice and that lead to good results. Whether or not they are told these methods "on authority" or helped to discover them for themselves is left to the individual teacher, but all are supposed to know them by the time the type problems are completed and to consciously use them in designing and making the original or selected projects.

We feel that we have taken a real step toward standardizing our practice while at the same time leaving ample room for individual initiative and experiment. We also find that our boys come to us in the high school with a preparation that can be counted upon and without the wide differences that used to exist.



ELECTRIC TABLE LAMPS OF COPPER AND RED GUMWOOD, SHADES COPPER AND ART GLASS. 7TH GRADE NEWMAN MANUAL TRAINING SCHOOL, NEW ORLEANS, LA.

INEXPENSIVE BASKETRY. II.[1]

WILLIAM S. MARTEN.

WITH a great variety of materials at hand many baskets involving different processes can be attempted, such as work with braided rush and grasses, the woven work with cat-tail, splints or other flat materials, and the work with the weavers and spokes. However, in order to give very definite directions here, the processes that immediately follow will deal only with the continuous coil baskets. In all of these coil baskets with the use of the various materials the processes are essentially the same. With the exception of the starting the processes are very simple. Briefly they may be divided as follows: first, the starting (the forming of the first circle of the bottom); second, the adding of new strands (to keep the coil uniform in size); third, the regular stitching (which includes the keeping of a uniform space between the stitches); fourth, the adding of a new strand of thread (which requires the tying of a flat knot); fifth, making the turn and building up the sides (according to the required design); sixth, putting in the handles (when necessary); seventh, finishing off the top (the ending up of the last coil); eighth, polishing (the rubbing in of the varnish).

The best problem to begin the teaching of this form of basketry is the flat table mat stiched with silkatine or a fine cord. This is because the flat tying necessary in entering a new strand of the thread material, and the turning up of the side can be eliminated. The attention can then be directed simply to the starting, and the keeping of the size of the coil and spaces between the coil uniform. The use to which the basket is put will of course determine the size and shape, and the size will determine to some extent the materials to be used as well as the size of the coil and the space between the stitches. This regulation of the size of the coil, the spacings, and the stitches requires a very definite training of judgment.

PREPARATION FOR THE STARTING.

In starting a class in this form of basketry clear and positive dictation for the first step is necessary. It is a decided advantage to have this first step mastered by every one in the class. If the material for

FIG. 1. STARTING THE COIL. NEEDLE AND MATERIAL FOR THREAD IN RIGHT HAND.

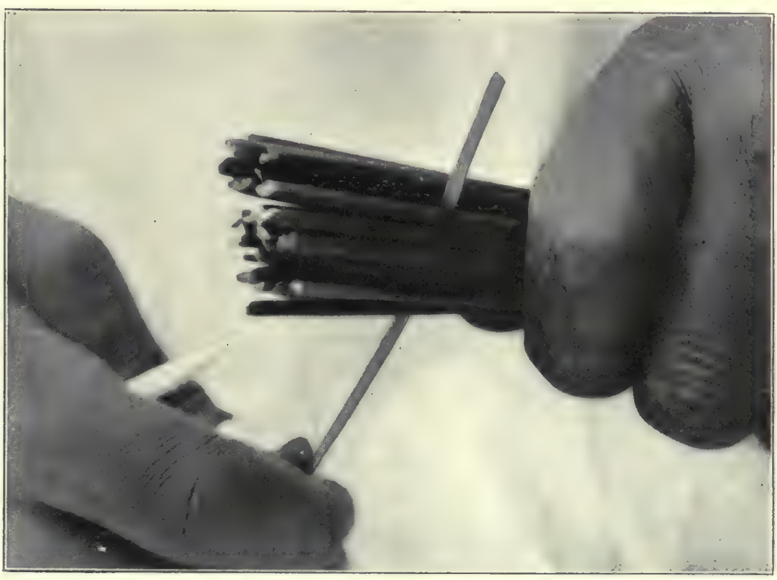


FIG. 2. STARTING THE COIL. END OF THREAD MATERIAL INSERTED BETWEEN STRANDS OF COIL.

FIG. 3. STARTING THE COIL. THREAD MATERIAL WRAPPED AROUND THE COIL.

FIG. 4. STARTING THE COIL. POINT OF NEEDLE THRUST THRU THE COIL TO MAKE AN OPENING FOR THE THREAD.

FIG. 5. STARTING THE COIL. SHARPENED END OF THREAD INSERTED IN OPENING MADE BY NEEDLE.

FIG. 6. STARTING THE COIL—THE TIE.

the coil is not pliable the strands used to begin the basket must be dampened. If they are stiff and brittle it will be impossible to bend them into a good shape. The number of strands to make up the coil is determined by the size of the basket. A small basket such as the lunch basket, collar box, or table tray will of course require few strands of the material (perhaps a quarter of an inch in diameter), while the large clothes hamper will require a large coil (perhaps three-quarters or one inch in diameter). To start with, and until the first circle is completed, the coil should be less than full size (about two-thirds), else the center will be somewhat hard to round up into shape.

Hold these strands, suitable for starting, in the left hand with the long free ends pointed away from the worker, as shown in the illustrations. Hold the needle and the material for the thread with one end sharpened in the right hand, as in Fig. 1; now slip the end of the thread, that has not been sharpened, in between the strands of the coil, as in Fig. 2. Then wrap the thread two or three strands around the coil, as in Fig. 3. Three strands around should be used in the large baskets as it makes the coil very much firmer and less liable to come loose when making the first stitches. To make the tie, which is really the first stitch, make an opening for the thread by forcing the point of the needle in thru the middle of the coil. Let the point of the needle protrude from the side of the coil past the loop of thread, as in Fig. 4. In doing this the thread must be kept taut, else it will come apart easily and have to be re-arranged. Put the sharpened point of the thread thru this opening, as in Fig. 5, and pull it up tight, as in Fig. 6. The tie (the first stitch), is now completed. Occasionally a beginner will take this stitch from the wrong direction, backward, as in Fig. 7, which makes it impossible to proceed further until this mistake is corrected.

THE SECOND STITCH.

The second stitch is made almost like the first. Force the point of the needle inside the loop of thread at the side of the coil, as in Fig. 8. Put the thread thru this opening and pull it up tight, as in Fig. 9. Notice that the thread is looped around the coil a little distance from the first tie. In pulling it taut a slight curve of the coil is produced. A mistake frequently made is to loop the thread around the coil at a distance too far from the first tie, as in Fig. 10.

The third stitch is made in the same way as the second one. The thread is entered alongside the previous stitch, but in pulling the thread

FIG. 7. THE WRONG WAY TO MAKE THE TIE.

FIG. 8. THE SECOND STITCH. INSERTING THE NEEDLE.

FIG. 9. THE SECOND STITCH. MAKING THE TIE.

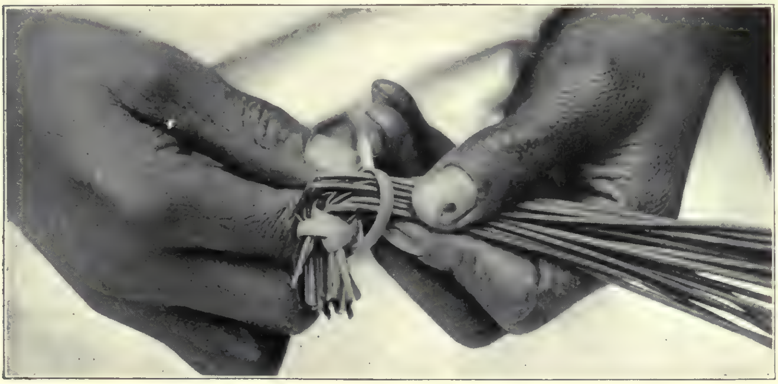


FIG. 10. THE SECOND LOOP OF THE THREAD TOO FAR FROM THE FIRST MAKING THE COIL CURVE TOO ABRUPTLY.

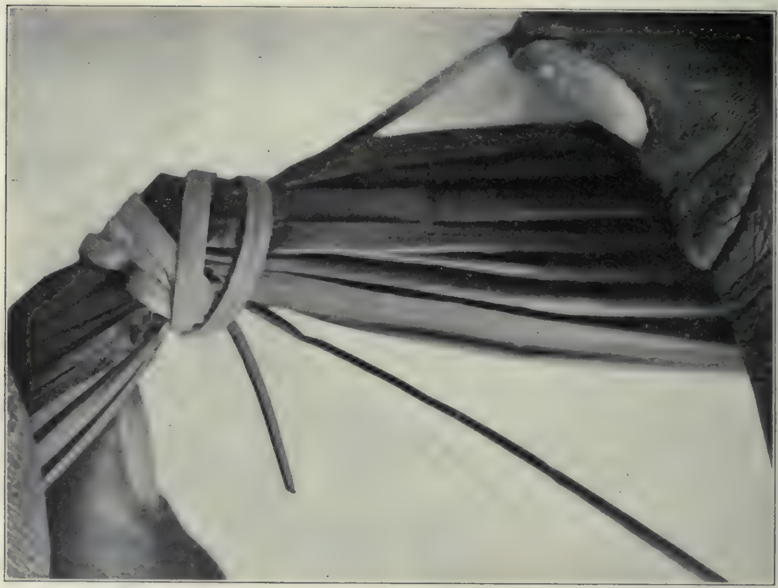


FIG. 11. SHOWING POSITION OF THIRD LOOP IN RELATION TO ONE AND TWO.

FIG. 12. THE FOURTH LOOP AND THE END OF THE COIL TURNED UP.

FIG. 14. NEEDLE IN POSITION TO TAKE LAST STITCH FROM THE CENTER.

up tight it is held with the forefinger, so that it loops itself around the coil a little farther from the second stitch, as in Fig. 11. By pulling and keeping the thread taut the tendency will be to curve the coil around preparatory for the first circle. This curving should be

FIG. 13. THE COIL AFTER THE FOURTH STITCH.

helped along somewhat by bending with the fingers. The next stitch is entered alongside of the previous one (this is important) and looped a little farther around on the coil, as can be seen in Fig. 12. The pulling of the thread taut will now tend to bring the short ends of the coil up at right angles with what is to be the bottom surface of the basket. The gradual turning up of these ends can be noticed in Figs. 11 to 15. These ends, the projecting part of which are later cut off even with the bottom surface of the basket, form the very center of the basket as shown in the illustrations. By repeating this stitch six or eight times, always entering each stitch alongside of the previous stitch and always looping each successive stitch a little farther around on the coil from the starting point, the first circle of the basket will be complete. Fig. 13 shows the progress made after the fourth stitch is taken, and Fig. 14 shows the needle in position ready to take the last stitch from the center. Our first step is now completed.

(*To be continued.*)

EDITORIAL

THE Illinois Manual Arts Association is making history. Its printed courses of study have been called for by supervisors, superintendents, and students of education in all parts of the country. At its latest meeting an excellent program was presented that had been built up on the general topic of "Vocational Training." A number of valuable papers were read, and the committee on courses of study brought in a report consisting of nineteen pages of revised outlines. Of even more interest than the formal papers and reports, however, are certain statements that were formulated at a special session held on Saturday afternoon, February 17th, after adjournment. It was felt that in some of the discussions now going on in this and other associations the speakers seem to be farther apart in statement than they actually are in opinion because they are not always talking or thinking about the same things.

Definitions Clarify Discussion It was decided therefore that it would be a good thing, as a preliminary to further discusison, to attempt to define certain terms in a way that would be satisfactory to the majority of those present. As a result of this attempt the following statements were agreed upon:

1. A reasonable amount of systematic training involving constructive activities organized for educational ends (such activities as are included in the term "manual arts"), is regarded as an essential part of the curriculum for the complete education of every boy and girl, irrespective of the length of time the child is to be in school and regardless of his prospective future career. This work is none the less necessary tho it be supplemented by vocational training.

2. By "pre-vocational courses" is understood work planned for the seventh and eighth years of the elementary school, in which approximately fifty per cent of the school time is devoted to various forms of handwork and the remainder to the essentials of those academic subjects usually scheduled for these years.

3. By "vocational courses" is understood courses of study two years in length, elective for boys or girls of fourteen to sixteen years of age, in which approximately seventy-five per cent of the school time is devoted to various forms of handwork, drawing, and shop mathematics, and the remainder to academic subjects. Such courses should be somewhat general in character in the first year, but may be differentiated and specialized in the second year.

4. By "trade courses" is understood courses, open to boys or girls over sixteen years of age, involving a school working day of not less than eight hours, in which practically all of the time is devoted to instruction in technical preparation for a specific industrial pursuit.

Preparation Demanded of Teachers

5. It is recommended that no form of manual training or vocational training be organized except under the direction of technically and professionally trained supervisors, and that the actual instruction in vocational training be not committed to teachers who have not technical preparation for the work to be taught at least equivalent to that represented by the training of the skilled artisan or journeyman.

It is quite possible, of course, for one to disagree with these "statements," but they at least furnish a platform on which to stand while debating. Whether one stands with those who "view with alarm" the proposition to require infants in the elementary school to choose their life careers at a given signal from the teacher, or with those who "deplore" the fact that every year thousands of young boys and girls leave the elementary schools because an unintelligent choice of vocation has been practically forced upon them, or whether one stands with neither of these parties, it is important to know what we are all talking about. —William T. Bawden.

Manual Training and Industrial Education

The revolt of enthusiastic advocates of industrial education against manual training and manual training methods a few years ago was in a measure justifiable, for manual training, as conducted in our schools, had become very largely a purely cultural subject.

As time goes on, however, it becomes more clearly manifest that there is not the wide difference of purpose between the original aims of manual training and the present aims of industrial education that there was at first supposed to be. That manual training had a decidedly practical or vocational aspect was clearly the thought of those who

first conceived the idea, both in this country and in Europe, as well as the thought of the early workers in the manual training field. Dr. Runkle in his report in 1876 seems to make this point very clear. He says:

"The question is, whether we can introduce the manual element into our system of public instruction, in order that a larger number of those whose education, as pupils, ends in the public schools, shall be led more directly than is now the case to some specific pursuit. . . . Thus it happens, that to-day, educators, law-makers, philanthropists, and all interested in the highest good of the largest number of people, or in the best development of our growing and varied industries, are looking for the remedy thru education, not of the head alone, but of the head and hand combined in the same system, in order that the education may lead each pupil to some definite end, or directly to the threshold of some special pursuit; that the student's skill of head and hand combined shall have some small commercial value when he has completed his prescribed course of study.

"There is a growing feeling that our public education should touch practical life in a larger number of points; that it should better fit all for that sphere in life in which they are destined to find their highest happiness and well-being. . . . It is true that our system of public education aims to prepare those who wish it for further literary and professional study; but for the large proportion of pupils, the grammar and high schools are finishing schools; and it would seem not only proper, but just, that they should be adapted to the wants of the larger number."

These sentences might well have been written by an advocate of industrial education within the past five years. Clearly the writer had in view practical or vocational benefit to be derived from manual training, and this thought was accepted as at least an important factor in the movement by early manual training workers.

Very shortly after the beginning of the manual training movement, two powerful influences were brought to bear upon it which tended to eliminate the practical aspect of the work. One of these was the introduction of the Swedish sloyd which stood solely for cultural development. Its influence was at first upon the work of the elementary schools, but later this influence was extended to the high schools. The second was the immediate popularity of manual training, which turned the tide of rather bitter opposition on the part of educators to the final

acceptance of manual training, under protest and on the tacit condition that the distasteful practical element should not be prominent. Under these influences manual training in the public schools became a purely cultural subject, abstract and wholly unrelated to the other subjects in the curriculum.

Industrial education will eventually accomplish the thing that manual training was at first expected to accomplish, so far as the public schools are concerned, and very largely along the paths and by the methods blazed by manual training. The new movement will have the advantage of influence not exerted in behalf of manual training; the demand is from without rather than from within the field of education, and it will be too insistent to be overcome by traditional educational standards; industry will be the vitalizing element about which the interest of the school will center, and more time for handwork will be demanded; there will be insistence upon practical methods, which are always the best methods; there will be demand for thoroly trained and skillful teachers; the schools of the future will be influenced more by the need of the present than by the traditions of the past; they will deal more with actual life experiences and less with abstract theories; activity will become more and more an essential element in the educational process, and manual training, or industrial training, or whatever it may be called, will be recognized as an important factor in educational methods.

—W. E. Roberts.

Mr. Smith Resigns

After an honorary service extending over seven years, H. Williams Smith is resigning the editorship of *Manual Training,* our English sister magazine. Added to his other activities he finds this part of his work an increasing tax on his health and strength, and so regretfully relinquishes it. He hopes to devote the time thus gained, to some extent, to general literary work, and will continue to contribute regularly to *The Schoolmaster* as well as to the magazine with which he has been so long and intimately identified. Mr. Smith conducts day classes in manual training under the London County Council; he also conducts evening classes at the Commercial Travellers' Schools at Pinner on the outskirts of London; and he is examiner in manual training to the City and Guilds Institute. Of all his occupations none, however, lies nearer his heart than the small amount of literary work which he finds time for, and which constitutes one of his chief recreations. We are glad to assure our

readers that he will continue to be our English correspondent. The following is his contribution to this issue:

The Ruskin Remedy Between forty and fifty years ago, one of our greatest English educationists, John Ruskin, said in "Time and Tide," "It would be part of my scheme of physical education that every youth in the State—from the King's son downward—should learn to do something finely and thoroughly with his hand, so as to let him know what touch meant; and what stout craftsmanship meant; and to inform him of many things besides, which no man can learn but by some severely accurate discipline in doing." Never in so few words has any man so well expressed the philosophy and practice of manual training as Ruskin has done in this passage. The recent report on manual instruction issued by the Board of Education, with all its virtues—and they are great—with all its vices—and they, too, are great—reckons its readers by the thousand, and is quoted in season and out of season; but that person who gives his mind to a full consideration of all that is implied in the golden sentence just quoted has (to adapt a phrase in that same "Time and Tide" paragraph) "learned a multitude of other matters which no man (nor Board of Education) could ever teach him." Let it be noted how discipline, discipline, is the interwoven melody in so many of Ruskin's glorious prose fugues. Every youth is "to do something finely and thoroughly," and to learn "by some severely accurate discipline in doing." Yes; that is how Ruskin himself learnt, and how every great master in every high department of human activity has learned. Manual training is a remedy, good reader, but it is a prescription that may do more harm than good to the patient if the physician be not a skilled and wise man, who will brook no dallyings, no shudderings, but get the remedy well administered even at the end of a thick rod if need be. The content of manual training as a subject in whatever suitable material is a sufficient qualification for its inclusion in every school curriculum; and its elements, in brief, are a seeing and hearing by the scholar how the thing is to be done, and then a sustained and, sometimes, often-renewed effort on his own part to do the thing himself as efficiently and effectually as his powers will permit. Take care of this, and then all your 'ologies, your individualisms, your expressionalisms, and your cultisms generally will take care of themselves. Waterloo may or may not have been won on the playing fields of Eton. The future Waterloos of Britain (and bloodless may they be!) will certainly be won in and around the schools of our land, and not least in the manual training workshops of those schools. In the meantime the "fag" fiend must be exorcised by "some severely accurate discipline in doing," and we shall do well to read our Ruskin rather more often and rather more carefully, and to give a little more time to the study of the Proverbs of Solomon on the rod and other matters involved in the training of children.

—H. Williams Smith in *The Schoolmaster.*

ASSOCIATIONS

ILLINOIS MANUAL ARTS ASSOCIATION.

The Ninth Annual Meeting of the Illinois Manual Arts Association was held at Peoria on Friday and Saturday, February 16 and 17. The first session was held at two-thirty o'clock Friday afternoon at the Manual Training High School building. At this session the Committee on Courses of Study presented a report consisting of nineteen typewritten pages, and containing outlines for the following courses:

Bookbinding for the fifth, sixth, seventh, and eighth years; printing for the seventh and eighth years; light woodwork for the fifth and sixth years; bench-work in wood for the seventh and eighth years; freehand drawing, one-year high school course; freehand drawing, the crafts, and design, two-years' high school course. Professor Bennett, Chairman, in presenting the report stated that the Committee had attempted to work along four special lines, as follows: (1) Outlines for handwork in rural schools following the four standards recommended in the report of the Illinois Educational Commission; (2) Outlines for handwork in township high schools and other secondary schools in villages and the smaller cities; (3) Outlines for handwork in elementary schools in the larger cities with a view to unifying the drawing and handwork of the first four years; (4) Outlines for handwork in city high schools.

George H. Jensen, Soldan High School, St. Louis, read a paper in reply to the question "To what extent shall Vocational Education influence our courses of study in the Manual Arts?" Three reasons were mentioned for the prominence given to the discussion of vocational education: (1) Educational progress has always been preceded by economic activity; (2) The direct demand for industrial education to take the place of the disappearing apprenticeship system; (3) The propaganda of the National Society for the Promotion of Industrial Education and other organizations. The speaker referred to the criticism frequently offered on the high school graduate that he has been in training for twelve years in disrespect of labor. He pointed out the importance of early opportunities for vocational training for boys and girls before they reach the age of fourteen years and leave school. He recommended that teachers in the elementary schools be encouraged to take their pupils on trips of inspection among the local industries and to impress upon their pupils the importance of specific training of some kind before entering upon any occupation.

Methods of organizing and presenting high school courses in shopwork and drawing were discussed by Albert G. Bauersfeld, Lane Technical High School, Chicago.

The courses were built up around the manufacture of a six-inch motor-head lathe, an electric blueprint machine, and an electric vacuum cleaner. Various parts of these projects were substituted for abstract exercises in the courses of

study. The paper contained also a very interesting presentation of a course planned for carpenters' apprentices who receive instruction one hundred minutes daily for three months each winter for four years.

Mr. Bauersfeld believes that one-half of the tool exercises now regarded as important in manual traininng courses could be eliminated without serious loss. From the vocational point of view he advocated the elimination of everything that does not contribute directly to industrial uses. He pointed out that it is constructive thinking that is demanded of workmen on the job, rather than a high degree of manipulative skill. General discussion of the topic "Courses of Study," was opened by Ira S. Griffith, Oak Park.

ANNUAL BANQUET.

Vice-President A. C. Duncan presided at the annual banquet which was held at Bradley Institute at six o'clock. A very acceptable dinner was served by the Domestic Science department, following a social hour in Bradley Hall. After a brief address by the Vice-President, the President's address was given by Professor Frank M. Leavitt, University of Chicago, on "The Mission of Manual Arts Instructors." Three main points were made, as follows: (1) We should be educational progressives and seek to advance educational thought and practice in every possible way, and not attempt simply to advance our own special interests. (2) We should do what we can to clear up the confusion that frequently exists between the two questions "What is the aim of education?" and "What is the business of the school?" These are not the same. It has been said that our schools are too frequently a place where our children learn to accept defeat with equanimity. Our business is to do what we can to teach every child to achieve success and to be satisfied with nothing less. (3) By virtue of our work we can see more clearly than some of our associates that certain lines of work make a strong appeal to the interests of young people. We must convince ourselves and be able to convince our superintendents that we can save to a longer school life many boys and girls if we are given the right to modify existing courses of study and methods of school organization and administration.

The principal address of the evening was delivered by Judge Rolland A. Russell, Superintendent of the Illinois State Reformatory, Pontiac. Judge Russell is a very pleasing and forceful speaker and held the closest attention of his hearers. After describing the greatness and magnificence of the civilization that has been developed in Illinois as one of the great commonwealths in one of the greatest nations of the modern world, he pointed out the disgrace involved in the conditions that make a reformatory a necessity. The climax of his address was reached when, in a most impressive way he put this question to his hearers: "You ask me what we are doing at the reformatory to help restore these boys and girls to a condition that will justify their release? and I, in Yankee fashion, ask you, What are *you* doing to keep these boys and girls from coming to the reformatory?" The address gave in outline a description of the various lines of work that are being carried on at the Illinois State Reformatory, embracing thirty-two different occupations.

At the Saturday morning session an excellent paper was presented by W. H.

Henderson, Springfield, on "Prevocational Work and Prevention of Delinquency; the Ounce of Prevention." He quoted the judge of the county court of Sangamon County, Illinois, who, after examining the technical work offered in the Springfield Prevocational School, said that he would not commit a boy to the school at St. Charles or the Reformatory at Pontiac if this school could take care of him. It was argued that if the Springfield school could be a means of keeping a boy out of the reform school the state should pay the bill. The per capita cost at the reformatory in $180-$190, whereas the per capita cost at the Springfield School is about $60.00 per year.

The state provides a University for the benefit of high school graduates and college graduates who wish to prepare themselves for their professions, and normal schools for the benefit of graduates of the common schools who wish to prepare themselves to teach, but the state provides absolutely nothing for the boy or girl who from necessity leaves school at fourteen years of age to enter the industries. The "ounce of prevention" is provision by the state of opportunity for vocational training.

"The Elementary Technical School of Evanston" was described by W. L. Pettit. In the elementary schools of Evanston shopwork and household arts have been offered in grades five to eight for the last ten years. The elementary technical school is an attempt to provide a course of study in which, from grades five to eight, approximately half the time is given to handwork and the remainder to academic studies. The school has an enrolment of about one hundred children; there are three instructors in academic studies; the technical work is handled by one instructor on full time, three instructors on part time, and the director.

The third paper of the session was read by Arthur F. Payne, Bradley Institute, on "Relation of the Artistic Industries to Vocational Education." He emphasized the point that construction and design must be developed together; they can not and should not be separated. He argued that a design is never complete until after the article has been made.

After informal but rather lively discussion the business of the Association was taken up and reports of officers and committees called for. The Committee on Resolutions brought in a report expressing the appreciation of the Association for the hospitable entertainment it had received and the fine program which had been enjoyed.

Secretary Newell presented a report showing that because of the demand for the 1911 report and the course of study booklets, both are out of print. The requests for the publications issued by the Association have come in from every state in the union and from many foreign countries, showing that the efforts to work out courses of study have attracted considerable attention.

The report of the Committee on Nominations was adopted and the following officers elected:

President, Frank M. Leavitt, University of Chicago; Vice-President, A. P. Laughlin, supervisor of manual training, Peoria; Secretary-Treasurer, A. C. Newell, director of manual training department, Illinois State Normal University, Normal.

Before the Association adjourned it was agreed that all who could should remain over until the afternoon and meet at two o'clock for an extra session. At

this special session it was decided to recommend to the Committee on Courses of Study that it prepare outlines governing the following lines of work:

1. Prevocational courses for the seventh and eighth years of the elementary school, in which approximately fifty per cent of the school time is to be devoted to various forms of handwork and the remainder to the essentials of the academic subjects usually scheduled for these years. It is suggested that the Committee outline the work in the academic subjects, as well as the handwork, so far as it may be able.

2. Three vocational courses, in pattern-making, cabinet-making, and carpentry, respectively, two years in length, in which approximately seventy-five per cent of the school time is to be devoted to shopwork, drawing, and shop mathematics, the work for the first three years to be the same in all three courses. It was agreed that these courses should be elective for boys of fourteen to sixteen years of age, and that later the Committee will attempt to make corresponding provision for courses for girls. —WILLIAM T. BAWDEN.

BOSTON MANUAL TRAINING CLUB.

The Boston Manual Training Club is not, as its name might imply, a local affair. While most of its members are from New England, it is represented in many states and even outside of the United State, as follows:— Maine, New Hampshire, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Pennsylvania, Maryland, Virginia, Ohio, Michigan, Illinois, California, and Nova Scotia.

The object of the Club is: First, to further the advancement of the manual arts by raising the pedagogical standard and by attracting the attention of the public more generally to the work and its results; and second, to offer to the members by means of lectures, excursions, reports, etc., opportunities for becoming conversant with the best thought and practice.

The standard of membership is high. The Membership Committee investigates each applicant's training and experience. Then the names of those who desire to join are sent out on the notice of each business meeting, and this gives any member a chance to notify the Committee if there are undesirable candidates. A new member, recommended by the Committee, may be admitted by the affirmative vote of two-thirds of the active members voting.

Men professionally interested in the teaching of the manual arts, are eligible to active membership: if employed or residing more than twenty-five miles from Boston they may be associate members. Other men are eligible to sustaining or honcrary membership, but active members only may hold office and vote.

ABRASIVES.

At the regular meeting held February 10th, at the North Bennet Street Industrial School, J. E. Rayner presented the subject of Abrasives. He exhibited a sample of carborundum direct from the furnace, stating that the mass when put into the furnace consisted of Pennsylvania or West Virginia coke, sand, dry salt, and sawdust, the latter added to provide vents for the gases as it was burned out.

Before the use of sawdust was introduced, ovens were frequently destroyed by explosions. Carborundum was the invention of E. G. Atchison and was made about twenty years ago. The inventor was not searching for a method of making artificial diamonds, as was commonly supposed, but was simply experimenting with high degrees of temperature. The first pound made was sold at the rate of twenty dollars a carat. To prepare carborundum a furnace is heated up during thirty-six hours to a maximum of 2,700 deg. F., and then is allowed to cool thru the same time.

The resulting mass is crushed, and the coarser grains of material are used in wheel form for grinding castings and granite, and for sawing and grinding marble. The marble of the Copeland Building in Boston was finished without the use of steel in any form. Finer grades are used for points of drills in dentistry.

The binding material, to hold the grains together, in oilstones is clay from New Jersey or Maine, and is practically the same as that used in making earthenware, being mixed wet and then fired.

The crystals of carborundum are diamond shaped, very brittle and hard. With the diamond ranked as ten in the scale of hardness, carborundum is about nine and a half. Alundum, which is about the same as aloxite, is tougher but not so sharp. The latter is made in a continuous arc furnace, and is useful in the difficult grinding of malleable iron.

In selecting wheels, choose hard, dense ones for cast iron. Hard stones hold their shape well, but soft ones cut better. Wheels will glaze when not suited to the work. The softer the work the harder the carborundum should be, and hard carborundum is that which contains more binder. There is little danger of injuring a carborundum stone, and it can have oil or other foreign materials burned out from it by placing it in any furnace. While carborundum cuts better than natural stone, the latter is preferable for giving a final cutting edge.

Massachusetts law requires grinding wheels to be protected. A new wheel should be tested to see if it "rings." Wheels are guaranteed, by the factory, for a peripheral speed of 5,000 feet a minute, and they are tested from 40 to 60 per cent higher than this. To "rough up" a wheel, use a Huntington or Metcalf dresser. For a wheel under twelve inches a stick of carborundum will suffice. In using a wheel for pottery, there should be a steady flow of water to keep the surface of the wheel free from dust. Marble resawing is done with steel blades, with sand, or carborundum. Slabs of marble $1\frac{1}{2}''$ thick may be sawed up into strips with a $\frac{3}{16}''$ carborundum wheel.

Tons of this carborundum are sent annually to India for hulling rice, thus saving 60 per cent. of the former breakage of the grains. It is used for the treads of stairs, for polishing leather, etc. The plant at Niagara Falls has thirty furnaces, each about 25 ft. by 8 ft. by 8 ft. From three to four tons form a charge, and the plant has a capacity of some twenty tons a day in all.

The core resulting from a firing is from 12 to 24 $''$ in diameter, including all of the original charge except a part which adheres to the top of the furnace. This does not crystallize and, under the name of "amorphous carbonundum," is used to line other furnaces, and will stand twenty heats before needing renewal. The India stones of commerce are made from carborundum or alundum.

Mr. Rayner distributed samples and catalogues to the members.

WOOD FINISHES.

W. R. Pratt discussed the subject of wood stains, dyes, etc. One gallon of stain is equal, in covering power, to four gallons of paint. The oldest, cheapest, and, for uniformity, best method, of staining wood is with a water stain. The chief objection is the raising of the grain, because of which novices do not care for it. Manufacturers have, therefore, worked up acetone, and, later, one coat waxed stains for amateurs.

Dyeing is a different process from staining, and is not so uniform. It needs speed and great care, and is not in present use by manufacturers. Pigment stains hardly show their pigment, and act as fillers, so that one coat is all that is necessary. These so called waxed stains do not really contain wax, but a satisfactory imitation, and, therefore, varnish can be used over them. If they did not have considerable body, they could not be varnished over without the use of a preliminary filler. While ordinarily not bright, continuous rubbing will bring up a polish.

The use of white fillers is only feasible with water stains. Any filler mixed with oil may be thinned with benzine. Penetrating and waxed stains may be thinned by the addition of turpentine. With regard to fillers, the more transparent the better. They could be made of ground glass if it were feasible, which would allow the grain to show thru. Silex seems to be the next best. It is a substance having a crystalline form of a needle-like shape. Silex is practically a pink and white quartz, and a superior quality is mined in Connecticut. It is about seven in the scale of hardness, being harder than glass.

Circulars and samples were distributed, and the following book was highly recommended to those interested: "Architectural Hardwood Finishing," by George Whigett, published by the Painters Magazine, 100 Williams street, New York City, price $1.00.

Discussion from the floor brought out the following facts: Stains should be kept air tight. Wax should not be used until at least twenty-four hours after staining, and a thin coat of white shellac preceding the waxing is desirable, especially in the case of mahogany stain. A finely sandpapered surface will take stain better than one which has been merely planed, but the dust should be brushed out before stain is applied.

PROPOSED BULLETIN ON THE MANUAL ARTS.

At a recent meeting of the Club, Charles A. Prosser, Deputy Commissioner, in charge of Industrial Education for Massachusetts, delivered an address in which he pointed out the need of defining the place of manual training, or the manual arts, in the public school system.

He called attention to the confusion of terms and the varying opinions that exist as to the functions of manual training, manual arts, technical high schools, trade schools and industrial schools, and suggested that the Club could make a real contribution if it would appoint a committee which would formulate standards for manual training, both in the grades and in the high schools.

He suggested that the State Board would be willing to publish such a document as a bulletin from the State office.

This task has been assigned to the Committee on Education consisting of M. W. Murray, supervisor of manual training, Newton, and Special Agent on Part-time Investigation for the State Board of Education; Alvin E. Dodd, director of the North Bennet Street Industrial School, Boston; and John C. Brodhead, assistant director of manual arts, Boston. This committee is now planning the work and hopes to get the cooperation of teachers and supervisors in different parts of the United States.

This report will probably be submitted to the Club for its approval some time in the early fall. Among other things it will attempt to formulate standards by considering such points as the following:

Aim. 1. What should be the stated aim of the manual arts for children up to the 12th year? 2. What should be the stated aim of training in the manual arts for children 12 to 14 years of age, or a period equivalent to the last two or three years in the grammar school? 3. To what extent should manual training contribute to general education, and what to vocational training? 4. What should be its relation to the manual training or technical high school, and should it attempt to give preparation for them? 5. What should be its relation to the industrial or trade school, and should it attempt to give training for these schools? 6. What part might manual training play in any scheme of vocational guidance?

Time Allotment. 1. Is it possible to secure proper results from manual training in the time which is usually allowed for this instruction; and if not, what should be the minimum period of instruction, per week? 2. If the period must be increased how can the additional time be secured; can it be obtained by a differentiation of groups and courses in the seventh and eighth grades in the grammar schools?

Organization and Administration. 1. To what extent should children twelve to fourteen years of age who have not reached the seventh grade be given the opportunity to take manual training? 2. To what extent should the differentiation in the course of study in the seventh and eighth grades be carried on in large centers of population in which the registration in these years in a given building will be large? 3. Should manual training in the upper grades of the elementary schools be compulsory or elective? 4. Do we hope to accomplish thru manual training the same general results for all children, or different things for different groups of children, and if the latter, how can the work be best organized to meet the needs of these different groups? 5. Are the groups now taught too large, and if so, what should be the maximum size of the class for one instructor? 6. What kind of training and experience should teachers for different groups have, and what should the compensation be to obtain and hold such teachers?

Method. 1. Should there be a certain amount of required work from each class, and if so, what should be the nature of this work? 2. To what extent should the student be allowed to choose his own job? 3. What place should technique or adult standards of workmanship have in any scheme of manual training, and what are reasonable standards? 4. To what extent should work in more than one material be given, as metalworking, woodworking, electrical work, printing, bookbinding, clay modeling, etc.? 5. Should the students be taught individually or in groups? 6. What kind of equipment will be necessary for different kinds of work?

Course of Study. 1. What courses of study can be formulated which will meet with the approval of the Boston Manual Training Club and teachers of this work in general?

A great deal of criticism has been directed against manual training and it is hoped to show thru this report that manual training is not at all antagonistic to industrial education, and that, if it is conducted according to the standards set up by this Committee that the community might well expect certain definite results.

COMMITTEE ON POSITIONS.

The appointment by the President of a Committee on Positions is a feature of Club work that should receive the hearty cooperation of every member, and that should prove suggestive to other organizations.

The work of the committee is: (a) To keep a list of such members as may desire a change of positions, and (b) To notify superintendents of schools, directors of industrial work, and others needing teachers of this list.

Members or others can serve the committee by sending to its Chairman, Clarence M. Hunt, 8 Maybrook street, Dorchester, Mass., prompt reports of any vacancies known to them.

It is desired to make this work a mutual help to superintendents of schools and club members.

The Western Drawing and Manual Training Association announces an interesting competition, which closes April 8th, 1912. The purpose of the competition is to provide decorative designs to be used in the 1912 and succeeding reports. Members of the association only are eligible to compete. The designs may be for seal, initial letters, chapter heads and tail pieces, and should be placed each on a separate sheet of paper, with the name and address on the back of each paper. Postage should be included for the return of drawings. The designs should be sent to Miss Lucy S. Silke, chairman of the Editorial Board, 3307 Rhodes Ave., Chicago, Ill. The names of the successful competitors will be announced at the Cincinnati meeting of the association, and will also accompany the drawings when published.

WISCONSIN SCHOOL ARTS AND HOME ECONOMICS ASSOCIATION.

This Association will hold its next semi-annual meeting at Eau Claire, April 12-13, 1912. The program includes the following papers and addresses: "The Artistic Side of Industrial Work," Harold Haven Brown, director of art department, high school, University of Chicago; "Some Phases of Domestic Science Work," Principal Thomas L. Jones, Madison; "Wisconsin's New Industrial Schools," President L. D. Harvey, Stout Institute, Menomonie; "The Lesson That Tuskegee Teaches," L. L. Summers, Oshkosh; "Educational Value of Printing in the Public Schools," L. W. Wahlstrom, Francis W. Parker School, Chicago; "The Manual Training Teacher and His Opportunities," F. D. Crawshaw, University of Wisconsin, Madison; "Some New Ideals in Woman's

Education," Mrs. G. R. Darling, Stout Institute; "Domestic Art in the Public Schools," Mrs Margaret Blair, College of Agriculture, Univeristy of Minnesota; "Balance in Education," President John A. Keith, State Normal School, Oshkosh; "Home Economics in the Rural Schools," Florence E. Studley, Stevens Point Normal School; "A Practical Course in Handwork," M. Emma Roberts, Minneapolis; "The Vocational Side of Drawing in the High School," Madge Anderson, West Division High School, Milwaukee.

An organized effort is being made to stimulate the sending of exhibits, and all indications point to a successful meeting.

The Miami Valley Schoolmasters' Club had a vocational education meeting on February 23d. A banquet was followed by addresses. President Carleton B. Gibson, of the Mechanics Institute, Rochester, N. Y., and Director Meyer Bloomfield, of the Vocational Guidance Bureau, Boston, delivered addresses. The meeting was well attended and a great deal of interest was manifested. Representatives from a number of large manufacturing establishments were present and took part in the discussion. There seems to be an earnest desire on the part of most school men and manufacturers in the Miami Valley to get together on the subject of vocational education. —FRED C. WHITCOMB.

The fourth annual meeting of the Iowa Manual Arts Association was held March 1st and 2d at Fort Dodge, Iowa. Professor F. D. Crawshaw, of the University of Wisconisn, gave the first address on the subject, "The Public School Manual Arts as an Agency for Industrial Education." This was followed by a paper on "Practical Cement and Concrete Work Which May Be Used in Manual Training," by Howard N. Two-Good. The discussion of this paper was led by E. T. Snively of Fort Dodge. A paper on "Practical Dietetics" was read by Cora B. Miller, of Fort Dodge. The association made side trips to the gypsum mills and mines, to the Clay Products Works, and to a shoe factory.

The Oklahoma Manual Arts Association held its annual meeting for 1911 in conjunction with the State Teachers' Association, Dec. 28-29. The attendance upon the association was the largest since its organization and the subjects of discussion showed the growth and development of the work in Oklahoma. Nearly every manual training, domestic science, and art teacher in the state was present.

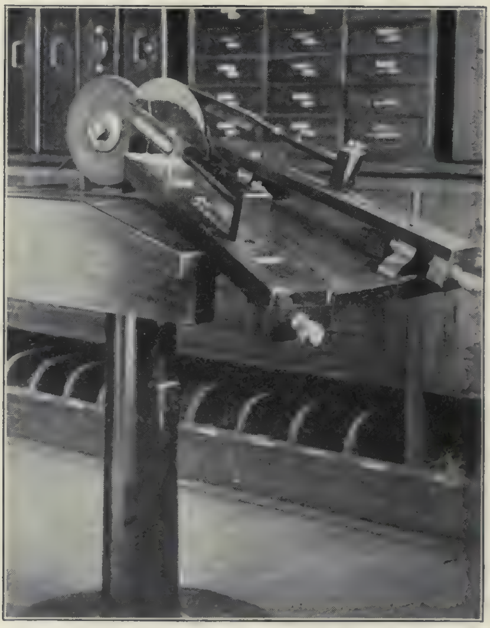
The papers read before the Association dealt with needs of the State University in the matter of a department of manual arts; values of manual arts subjects when considered in the light of entrance requirements; outline courses

in domestic science and art; and the need of a standard course of study in the manual arts and the adoption of a uniform style of drawings.

The teachers of domestic science and art united with the Association and several papers presented will be printed in the annual published proceedings

The officers for 1912 are as follows: President, Ralph W. French, Muskogee; Vice-President, H. F. Rusch, Oklahoma City; Secretary, L. P. Whitcomb, Darlington; Treasurer, A. W. Hornung, Oklahoma City.

The next annual meeting of the National Education Association will be held in Chicago, July 6-12, 1912.



APPARATUS FOR GRINDING GOUGES, PATTERNMAKING SHOP, COLLEGE OF ENGINEERING, UNIVERSITY OF ILLINOIS, URBANA. TOOL IS FED AGAINST THE STONE BY MEANS OF THE SCREW SHOWN IN THE FOREGROUND; ANGLE OF BEVEL AGAINST SIDE OF STONE IS SECURED BY VERTICAL METAL GUIDE, ADJUSTED BY SET-SCREW. FREDERICK ELLIS, INSTRUCTOR.

SHOP PROBLEMS

Geo. A. Seaton, Editor.

PUNCHING BAG SWIVEL.

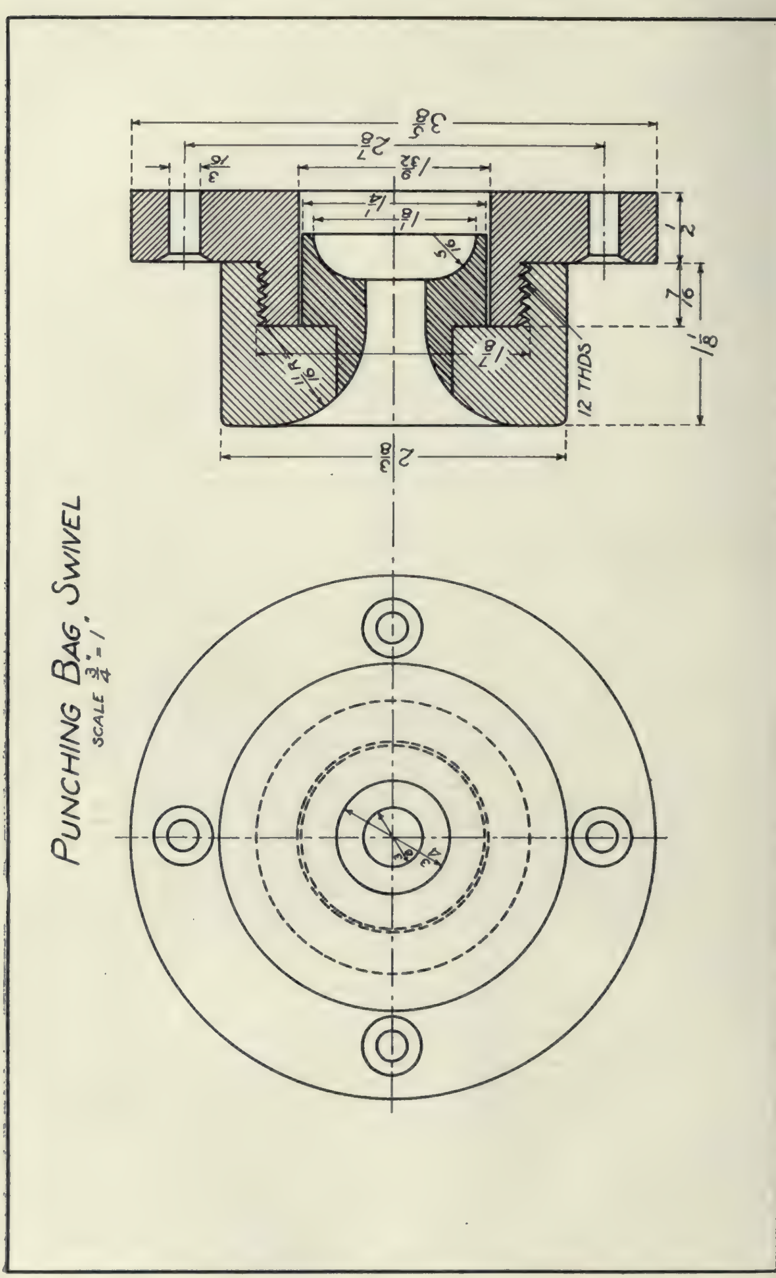
The students in the New York Military Academy, at Cornwall-on-Hudson, N. Y., are constructing several pieces of new apparatus for their gymnasium under the guidance of D. K. Hiett. The drawing is that of a punching bag swivel which was worked out for two platforms just constructed. This suggests a possible correlation between two departments in the school which can easily be carried out as there are a number of pieces of gymnastic apparatus well within the capabilities of the manual training class.

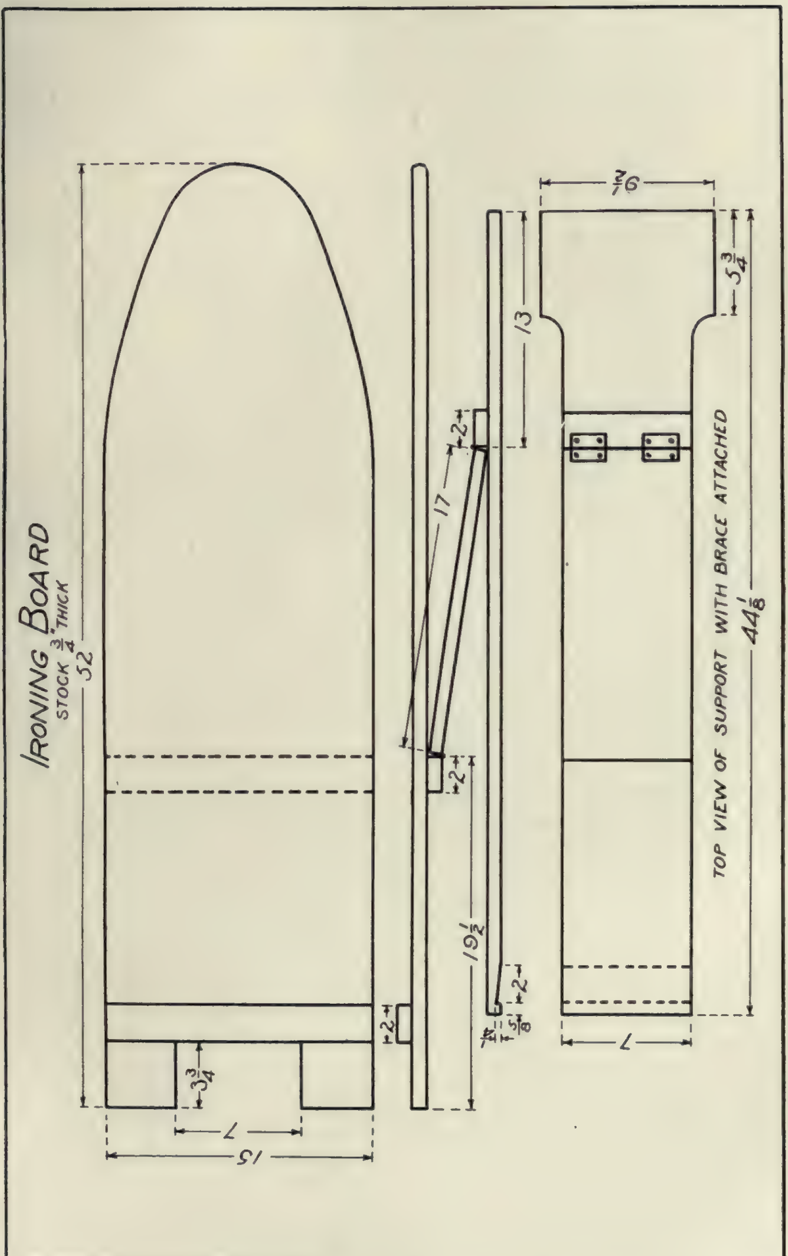
IRONING BOARD.

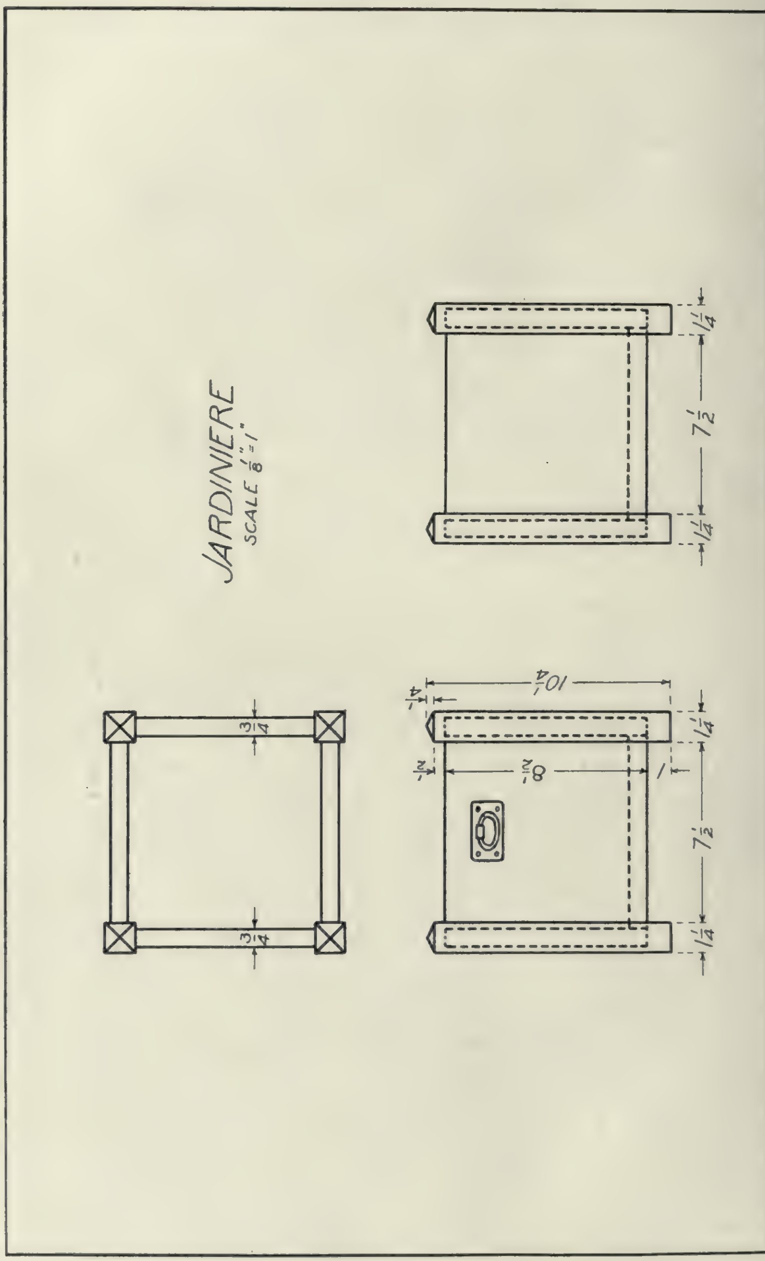
In this department was published in June, 1910, the design for an ironing board which would grip the edge of a kitchen table. Frederick B. Riggs of

IRONING BOARD.

Santee, Nebraska, submits the present design as simpler than the original but quite as satisfactory. The original triangular braces are replaced by a single board 7″ wide and 17″ long, so placed as to give a thrust toward the table. This board is hinged to cleats on the top and bottom boards. With the new brace the board is easier to make, folds up more compactly, and stands the test of hard usage. The dimensions given are for a table 28″ high, and will have to be altered slightly for other heights. Where the board is to be used with a table with a coved or beveled edge, the notch shown in the end of the lower board is not deep enough to hold. In this case a maple cleat 3/8″ deep and 5/8″ wide may be screwed across the end of the board, thus deepening the notch.


PUNCHING BAG SWIVEL
SCALE 3/4" = 1'
12 THDS


IRONING BOARD
STOCK 3/4" THICK
TOP VIEW OF SUPPORT WITH BRACE ATTACHED
52
15
7
3 3/4
2
17
13
19 1/2
9 7/8
5 3/4
44 1/8
7
5/8


JARDINIERE
SCALE 1/8" = 1"
10 1/4
8 1/2
7 1/2
1 1/4
3/4
1/4
1/2
1

JARDINIERE.[1]

The wooden jardiniere, while not so frequently met as that of brass, is none the less pleasing. W. E. Hackett of the Boys' High School, Reading, Pennsylvania, submitted the drawings for the one shown in this issue. The placing of the handle forms one of the most successful parts of the design.

ROUND TOP TABLE.

Dimensions for the ever popular round top table are furnished by W. E. Hackett of Reading, Pennsylvania. A small square or round shelf might be added on top of the lower cross-pieces. Occasionally a pleasing variation can be made by covering the top of the table with leather held in place by large headed tacks placed along the edge of the top. In such a case the top can be made of a cheaper lumber.

ROUND TOP TABLE

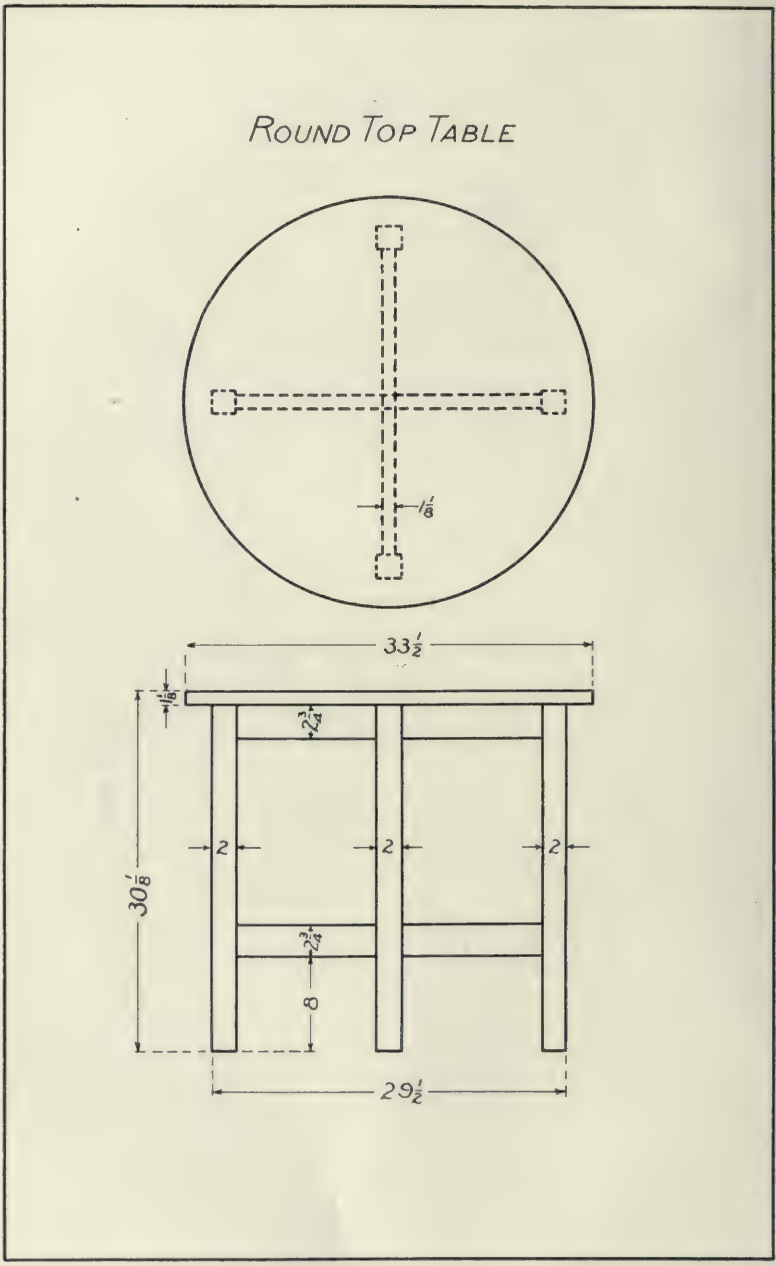
DICTIONARY STAND.

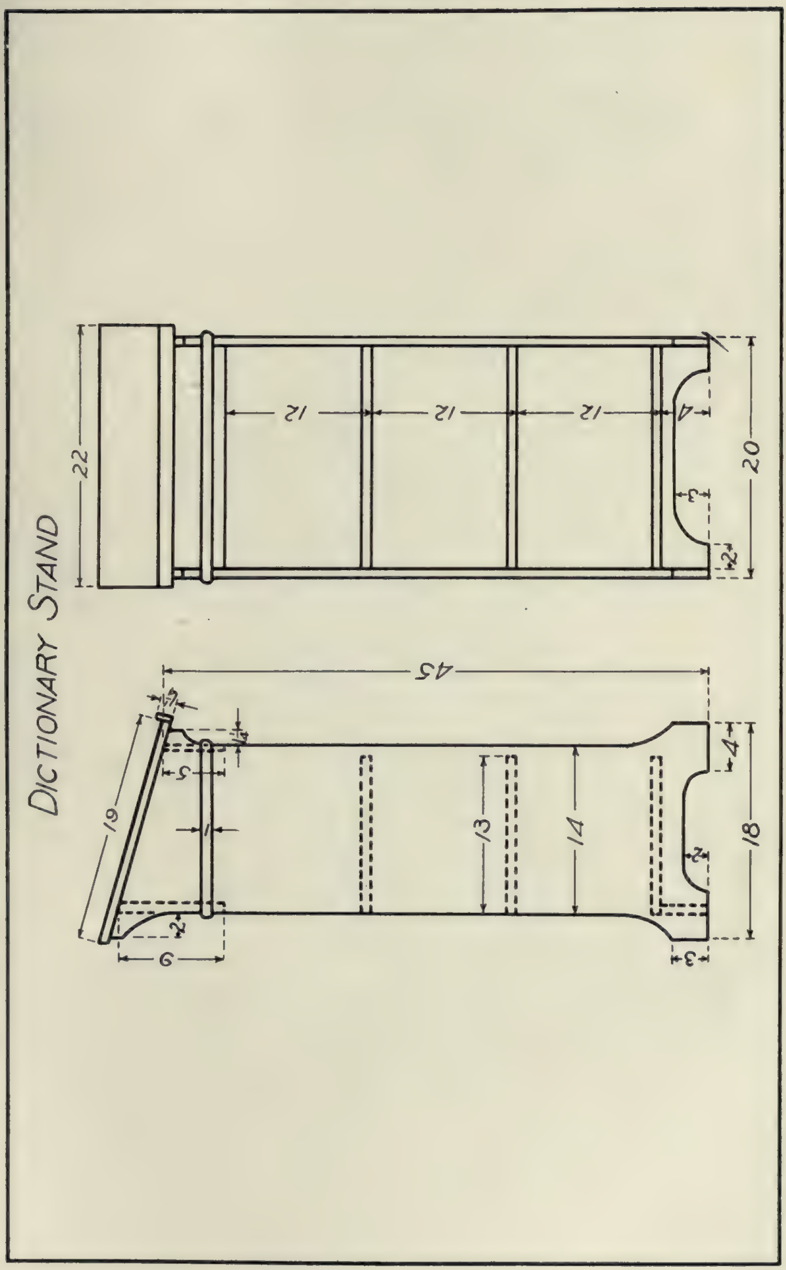
This is a piece of furniture that could find a place not only in the home but in every school room to accommodate the large dictionary that should be there. The shelves can be gained into the sides or allowed to extend thru and then dyed. The severe flat surface of the sides is broken by the molding. Rigidity is secured by the front and back pieces at the top of the stand as well as by the one at the bottom at the rear. The shelf room is convenient for encyclopedias, etc. Hans W. Schmidt of St. Paul, Minnesota, furnished the blue prints from which the drawings were made.

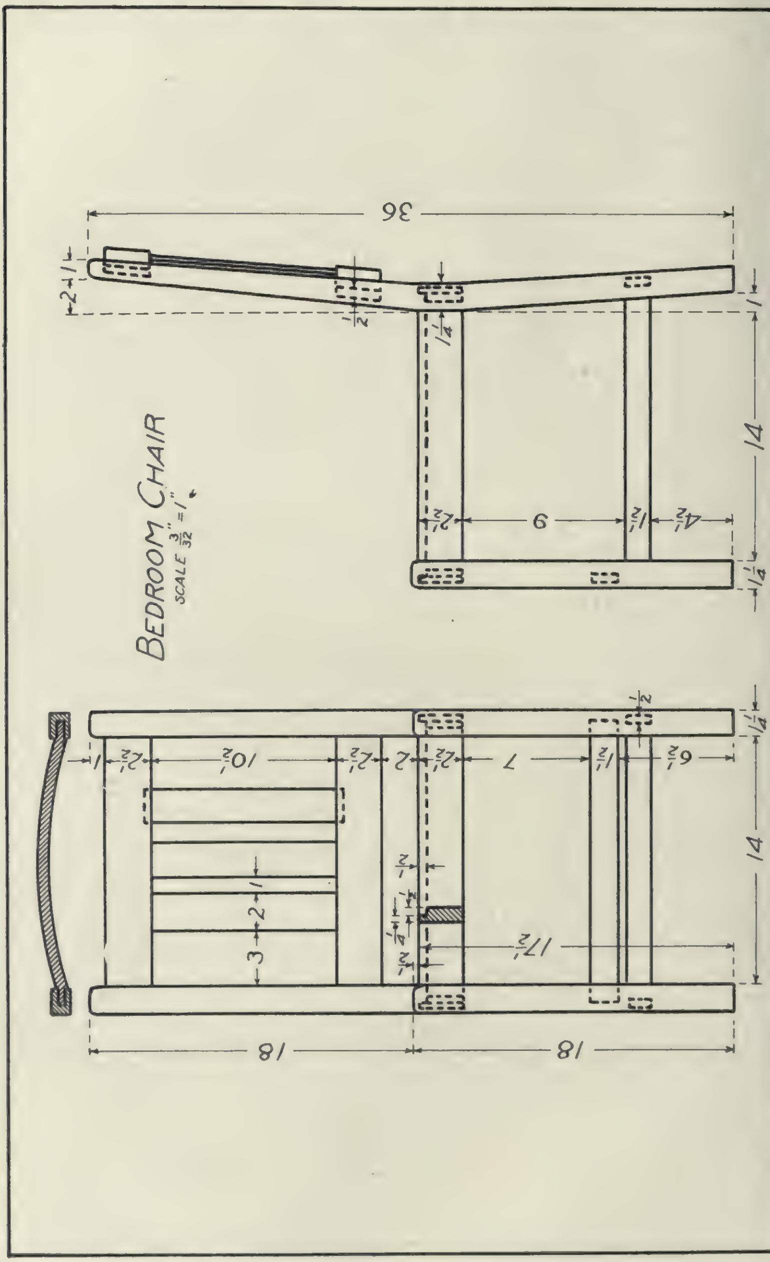
BEDROOM CHAIR.

This design for a bedroom chair was made and then worked out by a third year high school boy working under Phillip S. Hasty, New Orleans. This is a bit more difficult than the usual chair worked out in the shop yet it seems to have been carried thru with success. The greatest trouble will be found in the making of the lower side rails which must have shoulders out at an angle to fit the sloping back legs, and in the curving of the back rails. The pieces to be curved can be boiled for thirty minutes and then clamped to shape around a curved form. A strip of stiff sheet iron should be placed around the outside of the pieces beneath the clamps. When the pieces are thoroly dry the tenons can be marked out parallel to a straight edge placed along the concave side of the piece. For upholstering, a frame should be made to fit upon the ledge formed

[1] For illustration, see October, 1910, number, p. 60.


ROUND TOP TABLE
1⅛
33½
1⅛
2¾
2
2
2
30⅛
2¾
8
29½


DICTIONARY STAND


BEDROOM CHAIR
SCALE 3/32" = 1"
36
14
14
18
18
9
7
17½
10½

in the top rails. This frame should be covered by heavy 3-inch webbing woven in both directions, and tacked to the frame. Over this is tacked some heavy muslin. Another piece of muslin is tacked along the back edge of the frame and part way along the sides. Into the pocket thus formed is forced some curled hair, the second piece of muslin being tacked farther along the sides and finally across the front as the upholstering proceeds. When the frame has been well padded, it is covered with leather or other upholstering material.

BEDROOM CHAIR.

CURRENT ITEMS

STANDARDIZATION OF COURSES IN THE MANUAL ARTS.

Altho the manual arts now have a well established and recognized place in the public school curriculum, there is still a large work and an important problem before manual arts teachers. The widespread interest in industrial education and the publicity given to discussions of vocational training have given rise to a renewed investigation into the merits of the manual arts. It behooves manual training teachers to be prepared for this scrutiny, to cooperate and combine in standardizing their subjects, and in deciding what to retain and what to reject in the process of setting their house in order. Judgments as to the value of various forms of manual activity have changed among manual arts teachers in the last few years, and will doubtless continue to change, but surely the time has arrived when some attempt should be made to place the manual arts on as sound a basis as are such subjects as mathematics and history.

Some states have already accomplished much in this matter; others are awake to the need of standardization but have no organization thru which to work to this end. An outline of what has been accomplished in certain states may help suggest methods of procedure to those states which are still inactive in regard to this vital problem.

ILLINOIS.

Illinois educational organizations have been busy formulating courses in manual training since 1907. At that year's meeting of the Illinois Manual Arts Association, a paper was presented on the subject "A Course in Manual Training Suitable for Entrance Credit at the University," which contained a definite outline for a course in woodworking. A committee of five was appointed at this meeting to "work out a basis for and to undertake the formulation of a suggestive course of study beginning with the primary grades."

The report presented by this committee at the next annual meeting discussed chiefly the broad psychologic principles which should govern the formulation of a course of study. No formulated courses were included in the report, however. The following year the committee was reorganized but their report to the 1909 meeting gave no definite outlines for courses, altho at the 1908 meeting the desirability of formulated courses was emphasized by the presentation and illustration of the grammar-grade course of woodworking which had been published by the Illinois State Teachers' Association.

The next year the chairman of the course of study committee of the Illinois Manual Arts Association selected a group of workers, assigning each one a definite task. This resulted in printed outlines for all grades of elementary manual training, including woodworking, drawing, claywork, book-binding, textiles, and metalworking. The same committee was continued for another year with the duties of perfecting the grade outlines and of formulating high school courses. The result of the second year's work of this committee was a twenty-two page report which was included in the volume of proceedings, and had a

wide circulation which exhausted the supply. Many calls for it came from outside of the state.

The Illinois Educational Commission had been at work also, and in 1911 published a report dealing with agriculture, domestic economy, and the manual arts, and containing several new outlines of courses.

The State Teachers' Association is now revising its course of study published in 1907.

During the past year the committee of the Illinois Manual Arts Association has been striving to accomplish four things: (a) To prepare outlines of courses in the manual arts for rural schools, basing them on the "four standards" in the report of the Illinois Educational Commission; (b) To prepare outlines of courses in the manual arts for township and other small high schools; these to include woodworking, house-carpentry, cement construction, drawing, printing, etc., in general harmony with the report of the Illinois Educational Commission; (c) To prepare outlines of courses in the manual arts for elementary schools in cities having complete graded systems. These outlines are to include appropriate vocational courses for the seventh and eighth grades; (d) To prepare outlines of courses for city high schools based on outlines in the former report of the committee, but with additions and revisions that seem desirable, especially with reference to meeting vocational needs.

Some important conclusions were reached in preparing the outlines under (c), for the primary grades in city systems. These conclusions read as follows:

"It is believed that instead of treating each type of handwork in these grades as a subject—claywork, textiles, etc.,—a better plan is a correlated or unified course for these grades. It is suggested that various materials may be used and should include not only the flexible and plastic materials, such as paper and clay, but some more resistant materials such as wood. Skill and technique in handling these materials should not be the chief aim but these will gradually emerge as experience and familiarity with the materials make it possible. An effort should be made in these grades to strike a happy balance between the more formal work of the later years based on technique, and the spontaneous and free work of the earlier kindergarten period. The processes involved in handling the various materials should be carefully studied and the work planned within the capacity of the child. The work should not be measured by the finish and technique as viewed by adult eyes but by the interest and content value which it may contribute to the class work of the grade."

In the grammar grades the manual arts become subjects or a subject more than a method and consequently may appropriately be outlined as such.

The work of the committee will be continued for another year and attention will be given to vocational courses. The report for this year will be published in the book of proceedings and will thus be available to those who wish to learn the details of the courses already formulated.

WISCONSIN.

Wisconsin has a committee at work on standardized courses in manual training. The committee, made up of members of the Wisconsin School Arts

and Home Economics Association, was appointed by the president of the association, W. F. Faulkes, at the meeting of organization in 1909. The purpose of the committee was to investigate the status of manual training and to arrange a uniform course of study that would be suitable to the needs of the schools of the state.

The committee has so far arranged suggestive courses in the following subjects: paper and cardboard work, bookbinding, reed, raffia and textiles, elementary woodwork, clay modeling, hammered metalwork, joinery, furniture and cabinet-making, wood-turning, pattern-making, forging, machine-shop practice, mechanical drawing. Courses in carpentry and cement work will probably be added during the coming year.

It is planned to have these courses distributed to various schools of the state, these schools to try out the suggested outlines and make written reports to the chairman at the close of the present school year. Quite a number of schools in the state are already using the courses.

MICHIGAN.

The Industrial Science and Arts Association of Michigan is engaged in formulating unified courses of study in manual training. As the association meets three times a year the proposed course will doubtless be completed in a short time. The committee for drawing up the "universal" course was appointed in May, 1911, and at the last meeting, this year, the chairman read an outline for a course which will be sent to each member of the association for criticism. With the aid of these criticisms, the committee will continue its work, and expects to submit a course at the next meeting which will be sufficiently broad to meet the requirements of any place teaching the subject and which will receive due credit at the university. The course will be thoroly gone over at this meeting in May. The secretary of the assocation is M. W. Shillinger of Grand Rapids.

GEORGIA.

As far as can be learned, Georgia, alone, among southern states has attempted the standardization of manual training. The State Commission on Industrial Education is active in this direction, and presented at its meeting in Columbus, February 3d, an outline for a course of study, which gave the cost and nature of equipment for uniform courses in domestic science and art, manual training, drawing, and business training, suitable for all the high schools of the state. The outlines were thoroly discussed and revised at the meetings of the committee, and the resulting course of study will be detailed and put in final form by sub-committees and will be published in May. C. A. Maupin, principal of the Secondary Industrial School of Columbus, is chairman of the committee and has charge of the work of drawing up the course.

OKLAHOMA.

That Oklahoma is fully awake to the need for uniformity in manual arts work is shown by the resolutions adopted at the last annual meeting. The resolutions read as follows:

"WHEREAS, We recognize the need of uniformity of work and the standardizing of the courses of study in manual arts;

Resolved, In order that we may have a more uniform and standard order of procedure in our state and public schools, that we urge the presence of all teachers interested in manual arts at the conventions and meetings of the Oklahoma Manual Arts Association.

Further, That each teacher interested in the work contribute some part to the standardization of the courses of study and the adoption of a uniform style of drawings and models for the several grades.

Further, That we urge the calling of a convention of the representatives of the various manual arts associations of the United States, who shall devise plans and urge the universal adoption of a standard course of manual arts."

OHIO.

In Ohio the Manual Training Round Table of Southwestern Ohio has worked out and published a suggested course of study in the industrial arts for elementary and high schools. At the May, 1910, meeting, a committee was appointed to investigate what other states are doing with a state course of study in manual training and to recommend as to the advisability of preparing such a course for the Ohio schools. In December of that year the committee reported unanimously in favor of preparing such a course. The committee, increased by two members, was instructed to proceed in the preparation of a course. The committee was divided and the members assigned to the different grades of work, regular high school, industrial high school, and elementary school. The report of the committee was presented at the May meeting, 1911, was adopted, and its consideration recommended to the Ohio Art and Manual Training Association (representing the whole state).

OTHER STATES.

In New Jersey, no direct work in standardization is being done, altho the proposed plans of having state examinations for those desiring to teach the manual arts, and state examinations for entrance to the high schools, may have the effect of making courses more uniform.

In the effort to secure information regarding this work of unifying courses, letters were sent to every state in the Union. Replies were received from only a fourth of the entire number, which would seem to indicate that the larger number of states are as yet making no effort in this direction. Of the replies received, however, from states where no actual work is in progress, all expressed a keen interest in the subject. F. Paul Anderson of the College of Engineering, University of Kentucky, said, "I think you are striking the key-note when you begin to give some attention to the standardization of courses in manual training. . . . . If there could not be a universal standardization, I think it would be entirely feasible to have manual training work in any state regulated and supervised in such a way, as to have the manual training on practically the same basis as we have succeeded in placing mathematics, English, and physics."

We expect to continue the discussion of this subject in future issues, and would be glad to receive information regarding progress in the movement from committees or associations that are interested.

INDIANAPOLIS.

The course of study in manual training in Indianapolis has been changed this year and, altho the new plan is still in the trial stage, the results to date seem to indicate that the change will be of benefit. Previously a definite series of models was assigned to each grade with the result that the pupils often failed to do good work because of little interest in the required model. The new plan emphasizes processes with comparative freedom as to the objects to be made provided that they do not involve tool processes in advance of the work of the grade.

The shopwork under the new plan is to be designated as first year benchwork, second year benchwork, and third year benchwork. The following paragraphs, introductory to the course of study, explain the theory of the new plan:

"Let the keynote of the first year benchwork be "Interest." Demand and secure as good workmanship as is possible without diminishing this interest. In the second year emphasis should be placed upon technic and skill. In the third year benchwork it should be possible for the pupil to develop larger problems, not alone having an interest in the model for the sake of the model but because of the technic required to produce it.

The general idea of this course of study in benchwork is to make the boy feel a decided difference in each year of work; to make him feel that he has made a decided gain when he passes from the 6th to the 7th or from the 7th to the 8th grade. Having this thought in mind it will be necessary for the teacher to choose the grade of manual training best suited to the class in case it has a mixed grading. In case some pupils have already had tools and processes as suggested in the grade of manual training selected for their class, their interest can still be retained because of the possibility of selecting models which have not been previously made, but which as far as tools and processes are concerned, conform to the course of study. Because the tools and processes involved are the same as those given the entire class this will place little, if any, additional burden upon the teacher.

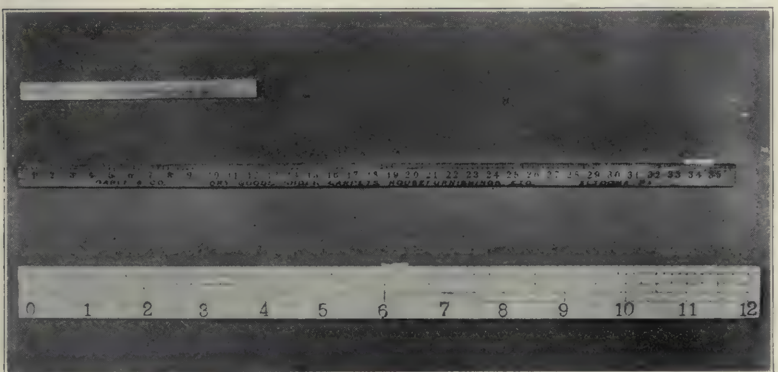
Briefly the models used in the first year of benchwork shall be based wholly on squaring boards to size, with additional processes such as beveling, reducing squared board to an octagon, boring, nailing or decorating, used when the model suggests it. The stock for these problems shall be furnished to the pupil sawed near to size.

Models used in the second year of benchwork shall have in addition to the processes used in the first year, the making of curved surfaces. This will open an avenue to any number of models and will at the same time be distinctly different from the first year work. Pupils in this grade should lay out, crosscut and rip their own stock.

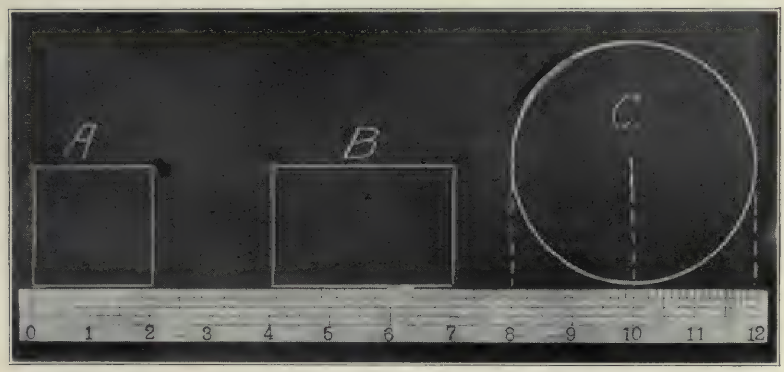
Models used in the third year benchwork shall embody more complex joinery including simple joints."

A BLACKBOARD RULE.

The accompanying halftones illustrate a new device originated by J. L. Noll in the manual training department of the Altoona, Pennsylvania schools. A long-felt need is a rule to use in blackboard work in connection with mechanical drawing and other courses where exact measurements are necessary.



THE FOOT RULE, THE YARD STICK, AND THE NEW RULE COMPARED.

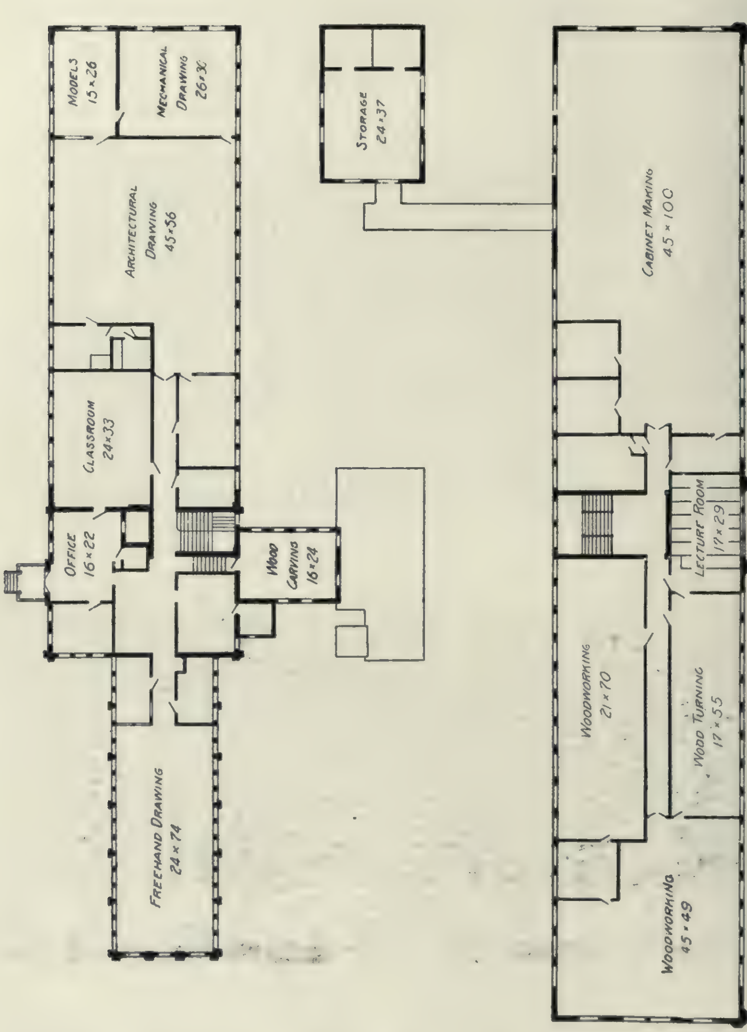


THE NEW RULE IN USE.

The ordinary foot rule and the yard stick have proved equally impracticable. This new rule is three times the length of the foot rule but is marked to resemble a foot rule in twelve divisions. The teacher using this rule can make the drawing proportionately correct and at the same time easily seen by all in the room.

The rule, which is of maple wood, is made in the woodworking shops. The back is beveled to allow the chalk dust to fall instead of blurring the line.

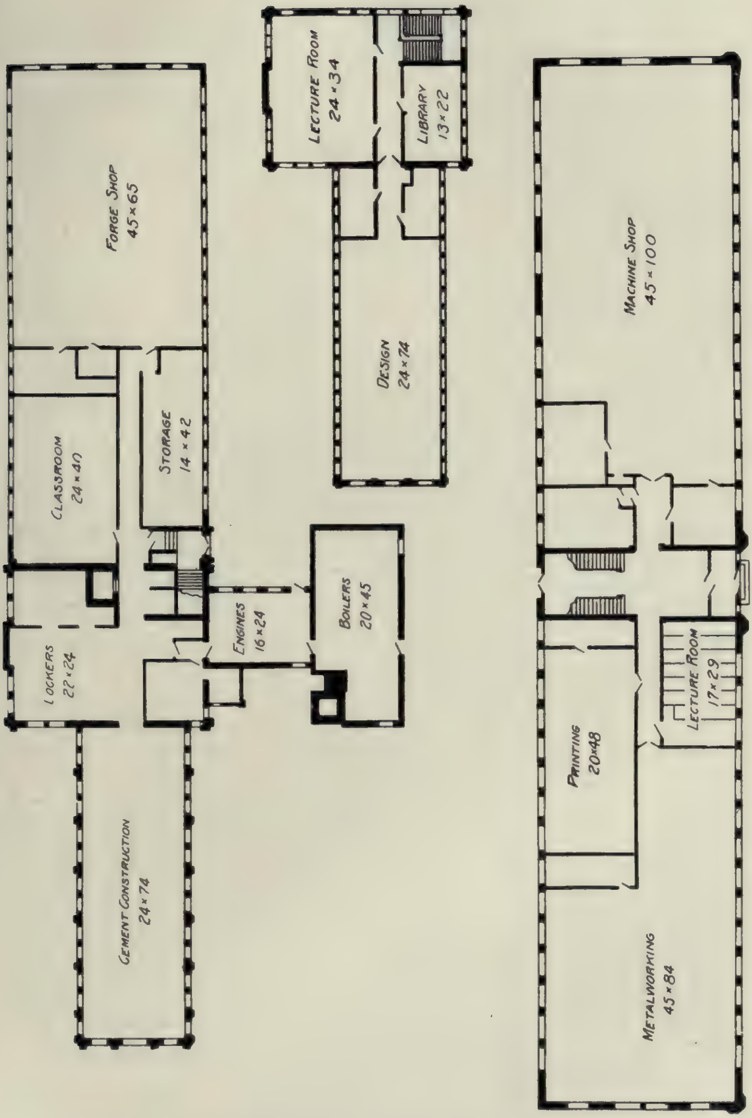
This will prove a welcome suggestion to the many teachers who have experienced difficulty in demonstrating lessons plainly and accurately at the blackboard.



MANUAL ARTS BUILDINGS, BRADLEY POLYTECHNIC INSTITUTE.

Second floor plan showing the woodworking department—a lecture room and four work rooms, the largest of which is being organized as a producing factory. Connected by a bridge to the north building is a room for storage, beneath which is the foundry. The second floor of the south building, showing offices, classroom, wood-carving room and three drawing rooms.

These buildings were formerly used by The Bartholomew Co. in the manufacture of automobiles. The entire floor space is 43,400 square feet.



MANUAL ARTS BUILDINGS, BRADLEY POLYTECHNIC INSTITUTE.

Ground floor plans showing machine shop, forge shop, printing shop, and lecture room in north building, and cement construction room, forge shop, and classroom in south building. The third floor plan showing design room, lecture room, and library.

CASS TECHNICAL HIGH SCHOOL, DETROIT.

Detroit, Michigan, has recently opened a new technical high school, which is equipped with two cabinet-making shops, and wood-turning, pattern-making, forge and machine shops. The school will be conducted twelve months in the year, and will have in addition to the regular sessions, afternoon and evening sessions.

The school has a four-fold purpose; to give a boy a practical high school education, substituting, in place of the foreign languages, mechanical drawing, shopwork, mathematics, physics or chemistry; to prepare a boy for a higher technical education as given by the schools of engineering of the universities; to facilitate the instruction of apprentices in the woodworking and metalworking trades by giving part-time instruction to boys already employed in the shops in subjects related to their special work, (such as shop mathematics, shop science, etc., the boys coming from their factories to this school one-half day a week); to give instruction in evening classes to mechanics and apprentices who are ambitious to increase their knowledge by a broadened experience in the use of machinery and by lessons in shop calculations and mechanical drawing pertaining to the particular trade in which they are employed.

Two courses of study are offered; the mechanic arts course and the general science course, with shopwork a prominent feature in both courses. English, applied mathematics, mechanical drawing, art and applied design, with shopwork, are the basis of the first two years' work in both courses. During the last two years students will be given an opportunity to specialize in subjects for which they show special aptitude.

In arranging the rooms in the building it is worthy of notice that no shops have been placed in the basement but all are provided for on the first floor. An industrial museum room is found on the second floor. Twelve hundred students can be accomodated.

The mechanical courses are in charge of E. G. Allen. Benjamin F. Comfort is principal of the school.

Milwaukee County, in Wisconsin, will have ready in the fall of 1912 a $200,000 School of Agriculture and Domestic Economy. Eight buildings are in course of construction, an administration building, a horticulture, agronomy, and soils building, an animal husbandry and dairy building, a dormitory, the superintendent's residence, the heating plant and barns, and a live stock judging pavilion. Excellent opportunities will thus be provided to young people to learn the arts of farming and home-making.

Three cities in Nevada have manual training, Goldfield, Elko, and Reno. Tonopah will have manual training and domestic science next year. In Goldfield the manual training work is closely correlated with the art work, and consists of woodworking and the crafts. The development of initiative in the pupils is considered of great importance in the Goldfield work. In the high school domestic science is an accredited subject.

NEW BRITAIN'S NEW HIGH SCHOOL.

The new high school which will soon be completed in New Britain, Connecticut, will take rank with the progressive high schools of the country. Its enterprising spirit is evidenced by the courses of study which have been prepared in view of the enlarged facilities furnished by the new building. There are now arranged a general course which furnishes a general education and normal preparatory work; a college preparatory course; a clerical and commercial course; an industrial course, which in addition to a general education aims to give practical training to those who expect to seek employment in the manufacturing industries; and a domestic science and art course for girls. Two-year commercial and industrial courses will also be provided for those who cannot afford the time for the full four-years' course. These two-year courses will be credited toward graduation should the student decide to continue in school.

The industrial course is made up of required subjects and electives; the required subjects for the first year being English, advanced arithmetic, physical culture, and elocution; for the second year English; for the third year English and English history; for the fourth year English, United States history, and the study of governments. The electives are, shopwork, joinery, wood-carving, cabinet-making, pattern-making, molding, wood-turning, machine shop practice, (elementary and advanced), chipping and filing, tool and die making, and mechanical drawing.

In the domestic science and art course the requirements are the same as for the industrial course. The following electives are provided: household arts, hand and machine sewing, cutting, cooking, dress-making, design, drafting and fitting, laundering, cooking, chemistry of foods, millinery, art needlework, household science, including sanitation, dietetics, marketing and accounts, decoration, home nursing, and the feeding and care of infants.

It will be seen from a study of the arrangement of this high school curriculum that all classes of students have been provided for under one organization. The student who intends to go to college, the student who is interested in mechanical pursuits, the student who likes business, and the student who doesn't know what he wants to do, will find a course suited to his needs. A rule of the school which allows a student taking one course to elect subjects from another course assists the general course student in "finding himself."

Many educators consider this plan of having the various activities under one roof as the ideal for the high school of the future—rather than the plan of separating students into distinct classes in various buildings, such as a manual training high school, an English high school, a commercial high school, etc. The experiment in New Britain will give these educators an opportunity to test the plan, other things being equal.

Adelphi Academy, Brooklyn, New York, one of the oldest institutions in the city, has recently added complete domestic science equipment and a manual training room. The academy has had classes in these subjects for several years which were instructed at Pratt Institute. Now that they have rooms and instructors at the academy, the courses have been enlarged, and include for the girls domestic science, household sanitation and hygiene. The girls also get experience in the serving of meals in the attractive colonial-style diningroom.

San Antonio, Texas, one of the largest cities of the south-west, has abolished Latin, Greek, and French from the high school curriculum. Stress is laid on the manual and domestic arts, which will be still further extended now that more time is available in the school program. The records of the San Antonio schools show that since manual training has been introduced the number of boys remaining in high school long enough to graduate has doubled. The number of girls completing the course of study has been increased also thru interest in domestic science and art.

The value of instruction in the manual and domestic arts and agriculture for colored youth is being more widely recognized in the south every year. At Shreveport, Louisiana, steps have been taken to place these subjects in all the colored schools of both city and country. The negroes themselves have raised funds to supplement the Board's appropriation, and in one locality they have donated five acres for the site of an agricultural building.

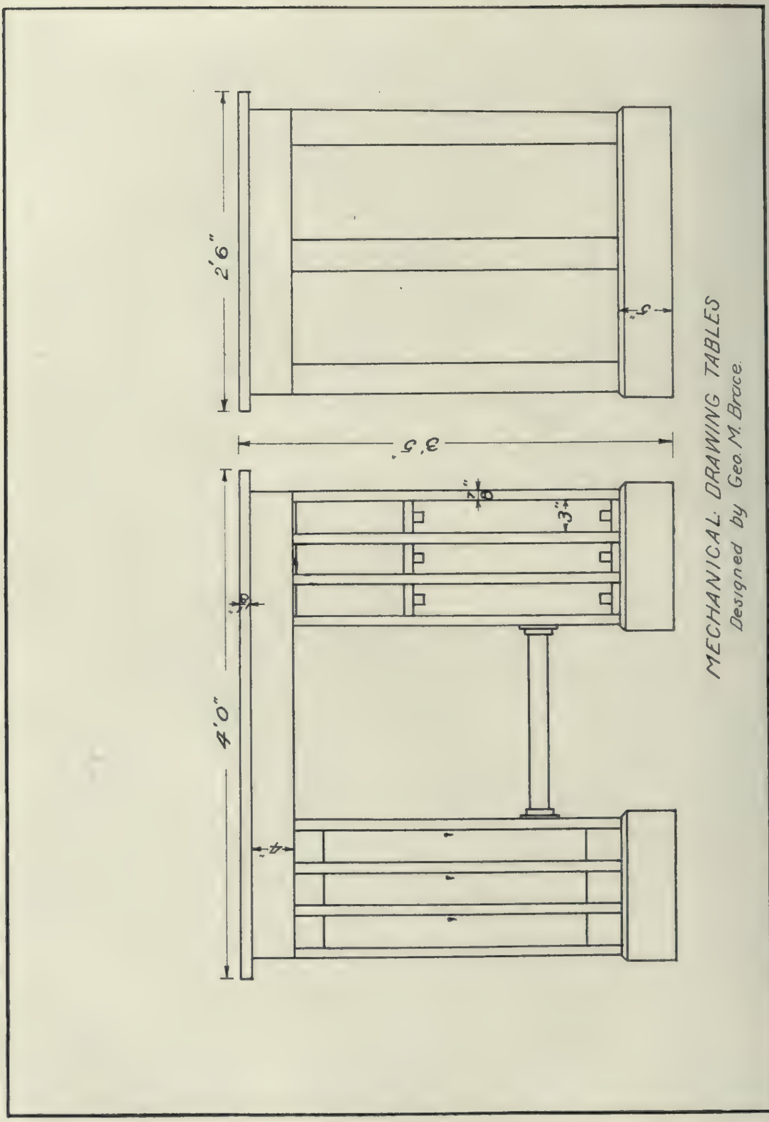
In the *Boston Common,* of January 20th was published a vigorous denunciation of basement schoolrooms. A practice, which had its origin in the introduction of manual training into already crowded schools, has been continued when conditions no longer make it necessary. There is no reason for placing shops for manual training or cooking in the basement in new schools, and there are many arguments to be offered against such a plan. The article referred to advances the principal argument, unhealthfulness, which alone should serve to prevent the continuation of the practice. There is no force in the plea advanced by school committees that the noise interferes with other work, since architects are prepared with plans for sound deadening material to be placed in walls and floors.

In those places where the shops are already established in basements, and no change is probable in the way of building—the school committees should see to it that such shops are floored and wainscoted with wood, well lighted and ventilated, and that sanitary conditions are maintained in other basement rooms.

In many places manual training has been started on an experimental basis, It is always interesting to learn in such cases that the subject has proved itself of sufficient value to warrant extension and enlargment of equipment. At Phillipsburg, New Jersey, manual training was started two years ago in the seventh and eighth grades and high school. This year it has been extended thruout the school system, in all grades. J. J. Berilla, the supervisor, is assisted by J. E. Barsby and Miss Martha S. Smith.

Less than ten years ago the manual and domestic arts were frequently pronounced, in print and in public utterances, "fads" and "frills." The tables are now turned. In a recent address at Traverse City, Michigan, the state superintendent of public instruction urged the wide-spread introduction of the

THE NEW HIGH SCHOOL EQUIPMENT FOR MANUAL TRAINING AT FREEMONT, OHIO.



MECHANICAL DRAWING TABLES
Designed by Geo. M. Brace.

"practical" subjects, the manual arts, and advised the elimination of a good deal of book work, such as the dead languages, some phases of mathematics, and some methods in English or reading which occupy much time to little purpose. In the newspaper report of this address the book work was referred to, in headlines, as "frills." While this is exaggeration, it is indicative of the change in relative positions between the manual arts and the purely disciplinary subjects.

Improvements have been made in the manual training department of the Kankakee, Illinois, high school. Eight benches and six lathes have been added to the equipment, the work of installing the lathes having been done mostly by the boys who have elected the course. The following subjects are now being taught in this department: mechanical drawing, joinery, wood-turning, and benchwork. George A. Todd is director, with Harris Blackball as assistant.

On the opposite page is shown the drawing of a drafting table in use in the high school at St. Paul, Minnesota, in the classes of George M. Brace. There is room in the table for twelve boards 20″x23″, in the six lockers, and above the boards in each locker is a place for instruments, T-squares, triangles, paper, ink, etc. One door covers the entire opening which is fitted with a lock and master key. The top of the table is made of white pine, the rest of it being of birch. The pupils stand at the tables while at work. Those for whom the table is too high use small platforms.

REVIEWS

Educational Needlework. By Margaret Swanson and Ann Macbeth. Longmans, Green & Co., New York, London. 6¾x8½ in.; pp. 136. Price, $1.35.

It is indeed a delight to find use and beauty going hand in hand as they do thru the pages of this charming handbook of needlework. Even the reader unfamiliar with the art of which it treats would find pleasure in the delicate harmonies of the color plates and in the finely executed line drawings. Such details as buttonholes and hemstitching are so clearly shown in drawings of such size as to be self-explanatory.

The finest quality of the book, however, is its vitalizing spirit which makes the "Cinderilla of the manual arts" a live subject with immense educational possibilities. This animating spirit and the educational theory of the whole plan of work are very well expressed in the preface by Miss Margaret McMillan. Briefly, the lessons are based on a sympathetic understanding of the physiological, mental, and emotional development of the child. In no other work on sewing have we found displayed such a thoro knowledge of the physical limitations and the mental attitudes of the average girl. Every precaution is urged in the suggested methods not to force development nor on the other hand to retard ambition. Happiness in activity is much emphasized.

Experienced teachers will find the approved methods and familiar models presented from a new point of view, but losing nothing in soundness of technique in the process of rejuvenation. The inexperienced teacher of domestic art will find the book a source of inspiration, for one feels in reading it that teaching girls to sew must be the most joyous work in the world.

The last part of the book deals more particularly with the decorative possibilities of needlework. The designs are broad, simple, and effective.

The authors of this book are instructors at the Glasgow School of Art in Scotland. American readers may possibly find an unfamiliar name among materials mentioned now and then but these do not seriously affect the understanding of the subject matter, since the context makes the meaning clear.

Teachers of domestic art cannot fail to appreciate a book of such high artistic quality and will find it rich in suggestions of educational value.

—V. E. Withey.

Eleventh Annual Report of the *Director of Education* of the *Phillipine Islands,* 1911, by Frank R. White. Manila Bureau of Printing. 6x9 in.; pp. 109.

This report will prove of unusual interest to manual training teachers because of the emphasis being placed on industrial education in the Phillipines. The development of educational facilities in the Islands since American occupation has been truly marvelous, and no part of the work has been more remarkable than the manner in which the manual arts have been adapted to local conditions.

The majority of Filipino pupils do not go beyond the primary school; so the burden of giving these pupils a preparation for life falls on the primary division of the school system. Industrial work for these grades has been made as practical, as extensive, and as thoroly standardized as is possible with the means at hand. Efforts in these directions are continuous and the next few years will see still greater efficiency develop. In providing for intermediate instruction, i. e., between the primary school and the high school, six courses of study have been arranged; a general course, a trade course which prepares for wage-earning as an artisan, a farming course, a teaching course, a business course, and a course in household arts. The authorities thoroly realize the advantages of deferred specialization but, in the words of the report, "We must so frame the system that the pupil is given the desired training while we have him in hand rather than put our dependence upon advanced instruction which he will probably never receive."

Thruout the educational system—in the high school, the normal school, the trade schools—adaptability to existing conditions is coupled with the development of leadership among the advanced Filipinos, which will yearly better the conditions. The Filipino teachers, going back to their native towns, carry with them practical knowledge which they apply at once in their school instruction.

Some of the results of the practical instruction are the best evidence of its efficiency, for example, Ingorot girls weave the cloth and make the clothing they wear to school; in another province over 1,072 home gardens were established thru school influence; the exhibit of vegetables sent to the Manila carnival from the Batac school, Ilocos Norte, surpassed in size and quality any crop ever seen in the Manila markets.

Not only is the industrial work interesting but educators will find much worth reading in the discussion of buildings, athletics, the teaching force, and extension instruction. —V. E. Withey.

Motor Work and Formal Studies. By Charles Davidson, Ph. D. The Study-Guide Series. H. A. Davidson, Cambridge, Mass. 5½x7 in.; pp. 128. Price, cloth 80c, paper 60c.

This book is the result of thesis work by two students of the department of education, who each prepared a syllabus for the work of the first three grades of the elementary schools. These syllabi were compared, revised, and combined. The resulting syllabus was then compared with the syllabus of the Horace Mann School for these grades. The final syllabus was arranged in the form of this book by Mr. Davidson.

The book is essentially a study of correlation with the motor activities as the center of the scheme. Much more freedom than ordinarily prevails is advocated in the conduct of primary programs. The division of grades into groups of not more than six children with a leader is a notable feature of the plan. Larger schoolrooms with more space for motor activities are urged, a measure which should receive attention from school boards. No new forms of manual training are presented. The value of the work lies rather in the plans for correlation, which will prove of assistance to primary supervisors and

teachers, since it is coming to be very generally recognized that motor work in the primary grades is best taught by the grade teacher, in some carefully planned scheme of related work. —V. E. W.

RECEIVED.

Leaf Key to the Trees and a Botanical Glossary. By Romeyn B. Hough. Published by the author at Lowville, N. Y. Price, 75 cents.

Forestry in Nature Study. By Edwin R. Jackson. Farmers Bulletin 468, U. S. Department of Agriculture, Washington, D. C. This bulletin outlines forestry study by grades, and gives suggestions for a forest museum, and a key to the common kinds of trees.

Strength Values of Structural Timbers. By McGarvey Cline. Forest Service Circular, No. 189, U. S. Department of Agriculture, Washington, D. C. Gives average strength value resulting from a large number of tests.

Some Important Insects of Illinois Shade Trees and Shrubs. By Stephen A. Forbes, State Entomologist. Bulletin No. 151, Agricultural Experiment Station, University of Illinois, Urbana, Illinois.

The Home Vegetable Garden. By John W. Lloyd. Circular No. 154, Agricultural Experiment Station, University of Illinois, Urbana, Illinois.

Annual for Edgar County Public Schools. 1911-1912. George W. Brown, Superintendent, Paris, Illinois. This annual is full of suggestions for those who are interested in the county school problem. It gives plans of a model school house, articles on agriculture, manual training and domestic economy, and includes an article on "The Ethical Value of Vocational Instruction in High Schools" by the late Frank H. Hall of Aurora, Illinois.

Cass Technical High School, Detroit, Michigan. Public School bulletin No. 24 giving a preliminary announcement of the new school which is modeled somewhat after the technical high schools in Cleveland.

Drawing and Manual Training. Outlines of lessons for elementary schools of Boston, Mass. Four pamphlets outlining the work by weeks for grades I to VIII inclusive.

Eighth Annual Report, School District Number One. Denver, Colorado. Contains quite an extensive detailed report by the supervisor of manual training, Milton Clauser. This includes cost of maintenance.

Addresses and Proceedings of the National Education Association. This is the report of the San Francisco meeting in 1911. Dr. Irwin Shepard, Secretary, Winona, Minnesota. Price, $2.00. The section devoted to the department of Manual Training and Art Education contains the report of the committee on college entrance requirements.

Sloyd Record, December, 1911, Sloyd Training School, Boston, Mass.

Exponent. State Normal School, Platteville, Wisconsin. The February number contains an illustrated article on manual training.

Report of the Public Schools. West Chester, Pennsylvania, 1910-11. Contains report of the Manual Arts Department by S. I. Kreemer.

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THE FIRST WEEK AT THE BEGINNING OF THE SCHOOL YEAR IN THE HIGH SCHOOL WOODWORKING SHOP.

CLARENCE BONNELL.

THE difficulties that beset the woodshop teacher during the first week at the beginning of school are essentially those of the teacher of any other high school subject. But the surroundings are different. The subject is relatively new. In many communities, the notions of what constitutes a manual training course and what it is expected to do for the young people who pursue it are held in mind vaguely, or, if firm convictions are had concerning it, these are often found to be to a great extent erroneous. There is no well-worn rut, cut deep and straight by experience and tradition, along which the young teacher of this subject may be guided until he becomes established in the new position, as might be the case with a teacher of any subject of the old time high school curriculum. So, while no really new pedagogical problems are encountered, such an array of strange and unharmonious material conditions prevails that the new teacher in the new position must be an organizer or face failure. The manner in which these obstacles are overcome and the manner in which the shop and shopwork are organized during and before the first week of school, frequently determine whether or not the year's work will be successful.

The following is written to suggest to those of limited experience some practical expedients, which, used in a shop where space and light and the instructor's time are all limited, have proved to be helpful.

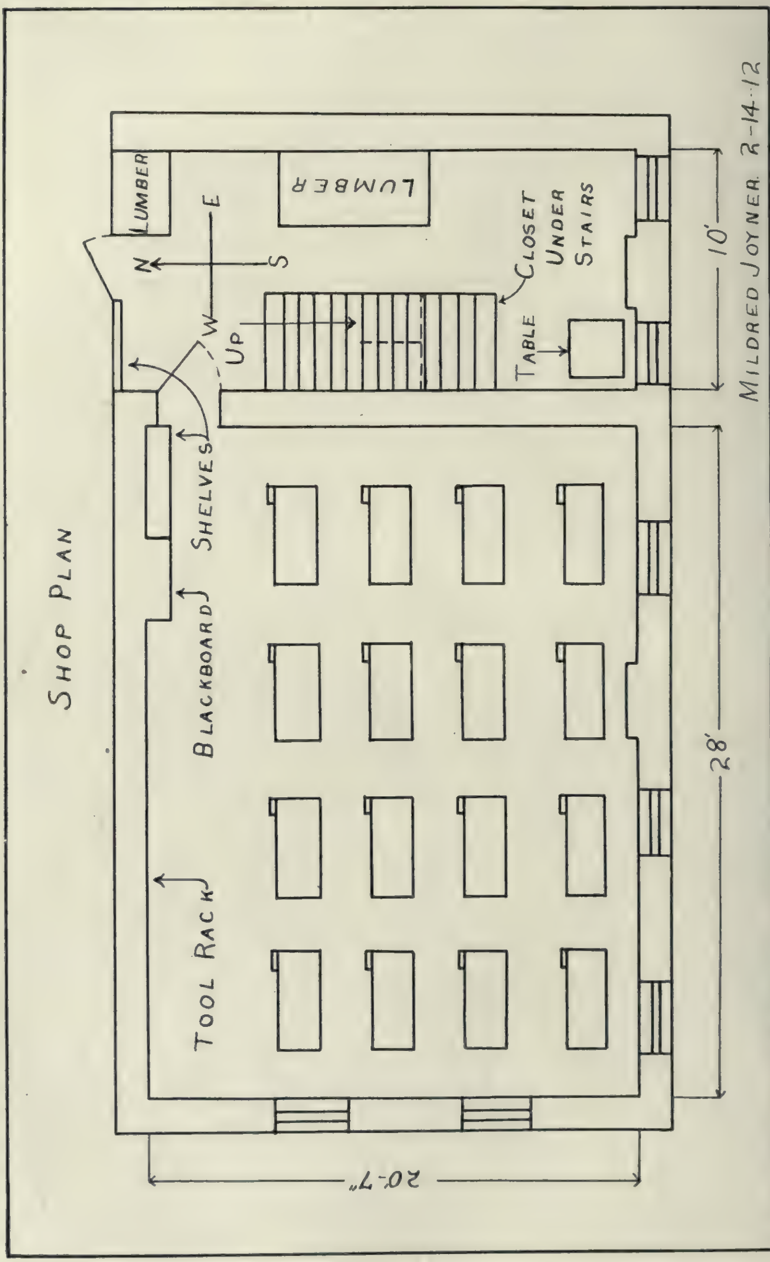


FIG. 1. FLOOR PLAN OF SHOP, HARRISBURG (ILLINOIS) TOWNSHIP HIGH SCHOOL—DRAWN BY FIRST-YEAR PUPIL.

For the shop here described, the best tools and benches that could be found had been provided,—and nothing more except a small appropriation for materials and a south-west basement room as shown. This room had a smooth concrete floor, rough brick walls, and bare joists above, and was reached from a stairway in a distant corner of the building thru another basement room and the furnace room. The storeroom shown in the shop plan was a part of the furnace room used for coal and kindling at times. The present condition of the shop was not brought about the first week, or even during the first year, but the general plan was formed during the two weeks before and the first week after school opened, so the plans then made are better explained by telling how they were carried out.

TURNING A BARE ROOM INTO A SHOP.

A smooth concrete floor affords an insecure footing for workmen and benches are not easily anchored to it. The tools which are almost sure to be dropped upon it are almost as sure to be injured at every fall. So, the first thing was to build a suitable wooden floor over the concrete. Part of the appropriation for supplies was invested in lumber for that purpose. Pine studding was laid flatwise across the room so spaced that lag bolts from the benches would extend into it. Pine flooring was laid over the studding and the benches were then spaced and the lag bolts put in. At the same time care was taken to insure against possibility of mice or rats getting underneath except by gnawing from above.

It then became necessary to utilize all available room not used by the benches or reserved for working space, see Fig. 1. The benches came in pine boxes four feet long. Enough good boards from them were saved to cover the upper and greater portion of the north wall, an inside one free from moisture. These were nailed at both ends to horizontal strips of the same material which had been spiked to the wall, thus leaving an air space next to the bricks. A board was nailed to the joists above, fitting against the upper ends of the boards already in place. This made a narrow high shelf for storage and gave a finish to that upper edge of the wall and, besides, held the boards against the wall so tightly that it prevented their slipping down with their weight of tools, clamps, and cases, see Fig. 2. It has been found convenient to have all general tools which will hang on nails, also cases for screws and nails, hung on the west part of this wood-lined wall, which

was painted white along with the remaining exposed brick walls. The white paint increased the effective lighting capacity of the five basement windows very perceptibly. On the north wall, east of the ventilating flue, shelves are placed as follows: About 12″ below the joists is a

FIG. 2. TOOL RACK FASTENED TO BRICK WALL; HANGING RACKS FOR LUMBER ABOVE.

shelf as wide as the depth of the flue, which is used to store drawing paper and reserve supplies of stains and other materials not often handled, see Fig. 3. Lower down, a narrow shelf holds glue, stains, oils, and brushes. Below this, there is a rack for boring tools, extra chisels, nail-sets, and so forth. Underneath all, are three shoe boxes designed to hold wood scraps of three different sizes. A large wooden blackboard, which also serves at times as a bulletin board, hangs against the bare face of the ventilating flue. Spikes driven into the east wall hold a dozen handscrews. Nails and hooks at the level of the window sills on the south and west walls are for pupils' work aprons. Steam pipes, suspended from the joists, extend around near the outer walls falling about 7″ below the joists but just above the upper part of the windows. The joists are eight feet above the floor, high enough so that the racks

extending 7″ below them do not interfere with the light, being on the same level with the steam pipes. They are of different sizes and designs to suit the positions they must occupy and the convenience of their users, but they extend down to a common level and are large and strong

FIG. 3. SHELVES FOR SUPPLIES.

enough to hold temporary supplies of oak or other heavy wood sufficient to make any piece of furniture that is practicable as a shop problem. They number about twenty and when partially filled with bright lumber increase the lighting effect of the windows by reflection. Being near the ceiling and as high as the warm steam pipes, lumber so stored is kept in the best possible condition. Frequent bridging of the joists supporting the floor above interferes with extensive use of the spaces between the joists.

The store room was made by building a wooden partition at the open end next the furnace room. The glazed door admits light to the furnace room from the windows at the opposite end of the room and from a window at the head of the stairway in the hall above. This

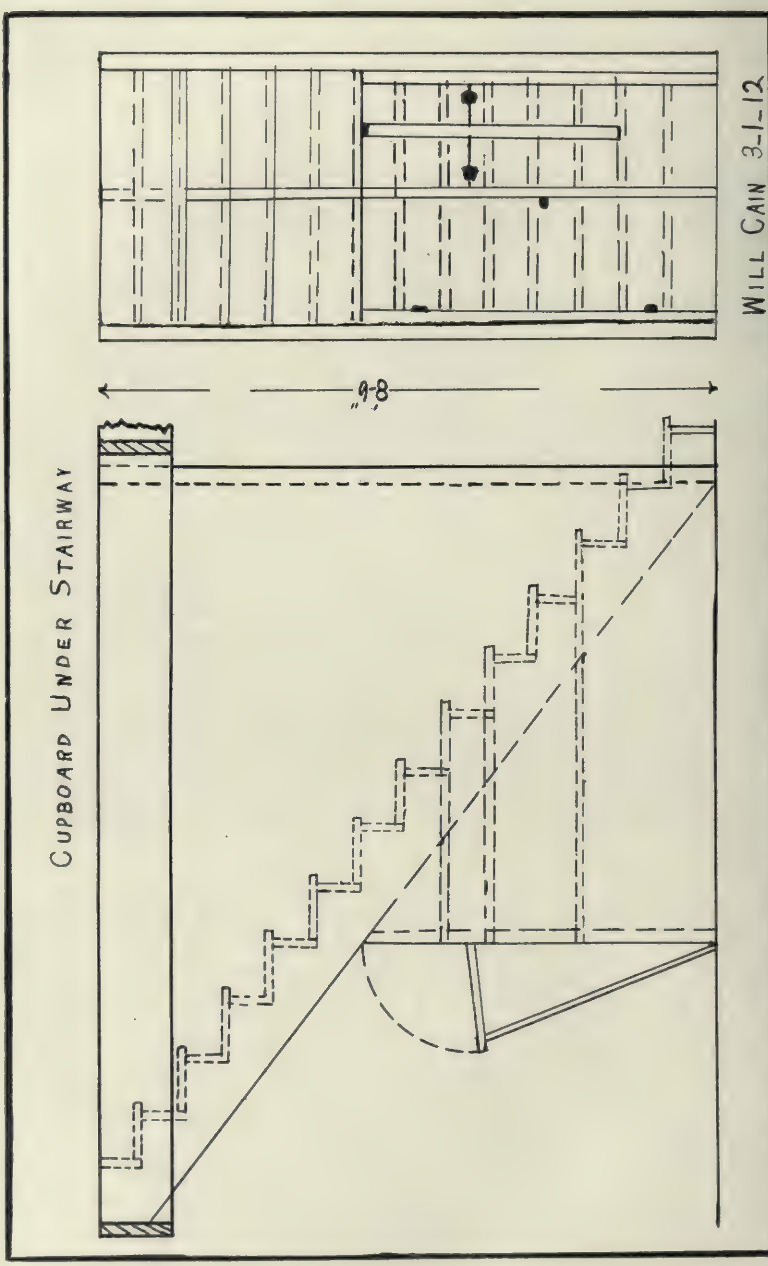


FIG. 4. DRAWN BY FIRST-YEAR PUPIL TO SHOW CUPBOARD UNDER STAIRWAY.

stairway was built entirely by pupils. Under it, is a closet for storage of non-inflammable supplies and appliances, see Fig. 4. The drop leaf door to the two shelves to the right and above is adjustable when open by means of the hinged leg and is often used as a drawing-board by the instructor whose drawing instruments, plans, and records are kept on the shelves. The two lumber racks on the walls, supplemented by smaller ones suspended from the joists, furnish room for several hundred feet of stock lumber. There is, also, room for rough sawing and a staining table in the southwest corner. Boards fourteen feet long can be handled in this room, the main rack being so arranged that they can be passed in at an open window and out for turning by way of the furnace room door. If necessary, such boards can then be passed into the main shop thru the two doors at once. A spring lock on the woodshop door makes access to the room entirely under control of the teacher, which is essential. It will be noted that everything, even the stairway, is arranged so as to increase rather than diminish the effectiveness of the light from the windows.

The above arrangement accommodates sixteen pupils at once, which is as many as one teacher can readily supervise. The space seems small, but there is plenty of room to work. Everything is at hand and under the eye of the teacher. It is not a model plan for a shop. It is merely what has been done with a room that was built with no thought of its ultimate use. No other teacher finds a room just like this one. But this one is typical of many. The point is this, that the new man in the new position should be quick to see the material possibilities in his new surroundings and make the most of them. If he finds a room built for the purpose, well lighted, and with equipment well arranged, his opportunity for contriving labor saving and time saving devices may possibly exceed that of his less fortunate brother.

COURSE OF STUDY.

Shopwork implies some end to be gained by some definite means. This means a course of study, a series of steps leading from the simple to the complex and designed to train the mind and eye and hand in the same orderly fashion.

It may fall to the new woodshop teacher to plan such a course, whereas the new teachers of mathematics and language in the same school find their courses already made, fixed by tradition, and embodied in the texts to be used. The manual training teacher may find

no books embodying the course suitable to his needs, altho books and periodicals bearing on many practical phases of his work are plentiful. Also, the few published texts on the subject differ so widely in their contents as to leave the searcher after a standard somewhat perplexed.

Courses of study are as much a product of evolution as is the Constitution of the United States. No single teacher originated a course of study in any subject. Much less is an experienced shop teacher to do so if unaided by the work and plans of many others who have gone over the field ahead.

Fortunately, the various manual training societies of the country have recognized the need of such guidance and have endeavored to gather the accumulated results of many workers into outlined courses of study more or less detailed. There appears to be closer agreement among these organizations than the great variety of texts and helps on the subject indicates. To illustrate, the Illinois Manual Arts Association, the High School Manual issued by the University of Illinois, the Educational Commission of the State of Illinois, and the State Course of Study for the Common Schools of Illinois all suggest courses which are practically the same. In some states such a profusion of courses and such unanimity concerning them may not exist, but a working basis accessible to the inexperienced teacher of any state may be had by inquiring of those higher up. There is such abundant opportunity for originality in working out details that the new teacher can well afford to accept the guidance of others as regards the main features of the course to adopt. Some recognized course should be adopted at the outset and adapted to the particular needs of the shop and the community concerned. The outline should be somewhat definite but flexible so that variety in the exercises may be had to suit them to the needs of the pupils of varying tastes and skill. The now generally recognized woodshop processes should be arranged in logical order. The individuality of the teacher should determine the particular problems involving them. Under no circumstances, should the work degenerate into mere practice in "making something useful."

INVENTORY OF EQUIPMENT.

The plan for utilizing the available space to the best advantage having been made and the course having been outlined, the lists of tools and materials should be checked up if such a list exists. If not, an inventory must be made, not only of the quantity and kinds of tools

and supplies, but also of their condition. I once found the janitor of a large building, in a city employing forty teachers, tearing up an old floor and cutting nails with several of the shop chisels the week before a new man was to arrive to reorganize the wood shopwork of the school. A brief inspection showed that the entire equipment was rusty, scattered about a dark basement, and in poor condition generally, while much of the left over stock of lumber had been used by the janitor during the summer. Every plumber, carpenter, or decorator that enters a school building during the vacation season seems to consider the woodshop supplies and tools his legitimate prey. The janitor must be of unimpeachable honesty and have an iron will if he keeps the equipment together. Nothing can be taken for granted. The actual equipment must be known. It must check with the list showing the actual needs, for whatever is needed can probably be obtained now more easily than later. However liberal the policy of those in authority, nothing should be asked for that is not needed since careful foresight inspires confidence for the future.

Tools are almost always left dull at the close of the school term. The new teacher, especially, rarely finds them otherwise. It is enough to ask pupils to keep their individual tools in condition after they have once been sharpened and made bright. Hence, every tool should be in good condition before school opens. I put keen edges on more than 125 edged tools every summer and find that it pays. During one summer illness prevented and the results proved the wisdom of leaving nothing of this nature to be done after actual work is begun with pupils.

The quantity and kinds of supplies necessary at first depends somewhat on the method of purchasing and the facilities for storage. What is necessary should be on hand at first and the supply should always be ahead of the demand. The same degree of system should obtain as in a business house. Economy of time and money are prime conditions and systematic management is as much the task of the teacher as is mere instruction.

ORGANIZATION OF INSTRUCTION.

The same quality of mind that makes possible the above preparation will organize the first week's actual work. Carefully planned exercises, necessarily simple but complete, should be worked out in advance so that work may begin at once and continue without interruption. It is important that everything—materials, models, and instruments—be

at hand and that a definite thing be done. It is worth much to have it said about the dinner tables in the homes represented on that first day of school that the teacher "knows his business." He may know a great many things about his business that will not be apparent if his manner is hesitating or uncertain on the eventful first day of school.

Shop rules are a necessity in school just as they are in a factory, but every rule must have a reason for its enactment. Also all questions of shop conduct cannot be covered by set rules. Many things must be settled when occasion arises, on the broad principle that conduct which in any way interferes with work or causes loss of time cannot be tolerated. Some talking while at work is necessary. Too much talking or talking of the wrong kind is an interference. An occasional penalty judiciously given will regulate this question if other things are done in order. The fact that battles with shavings, loitering, boisterous laughing, and inattention are said to be common occurrences in some shops suggests that a few cautions are not amiss.

Satan finds little work to do if all hands are kept busy. This sounds well. Keeping everybody busy is difficult because some work more rapidly than others. In a large class, there must be some waiting for individual instruction. Foreseeing this, the waiting, and the resulting tendency to disorder, can be reduced by requiring each pupil to remain at his bench until his turn with the instructor and by very careful assignments of work just so soon as the skill and personal characteristics of each pupil have been studied.

Benches and individual tools should be definitely assigned and much annoyance will be avoided if pupils are never allowed to use the bench or tools of another without special permission given for a sufficient reason. Positions at certain benches are often more desirable than at others. If no other reasons govern, places may as well be assigned by lot. This appeals to the sense of fairness. If a cash deposit, to be held against breakage or for the use of material, is required, it should be collected promptly and accurately accounted for. The prospect of deductions made from a deposit already in the instructor's possession, greatly encourages care with tools. Collections for breakage *can* be made after the damage is done, but the total sum so obtained from a class in a year will be more than by the deposit plan, especially if collections are postponed till the end of the term, for the reason that it is human nature to regard as greater the loss of a sum to be immediately checked off from the amount on deposit than the payment of the same

loss in the indefinite future. It is the same thing which makes a boy resolve the night before to get up when first called in the morning and then stay abed till pulled out. In practice, deposit money returned at the end of the year usually becomes the pupil's property either thru neglect to report its return at home or thru parental indulgence.

Tools for general use must be put in place as soon as no longer needed. This rule is difficult to enforce, tho its necessity is always accepted without question. It is a rule for the enforcement of which, moreover, the whole class will honor the instructor since no regulation adds more to the convenience and peace of mind of all concerned. This indicates the spirit in which rules should be given. More disorderly shops result from the non-enforcement of good rules than for the want of them.

THE TEACHER'S RELATION TO THE SCHOOL.

The woodshop teacher should remember that his work is only part of a more comprehensive plan for which other employes from janitor to principal are all working. A good plan is to attend to one's own business and to let alone the affairs of others. No institution is successful with more than one head. If the principal or superintendent has ideas that are wrong, he is to be pitied. But if, after careful and courteous explanations of the situation, he will not yield, it is his affair and he must bear the consequences of his decision. So the woodshop teacher is wise if he submits himself gracefully, as he would have his pupils do, to higher authority and if the task proves irksome he may seek a new position next year.

It is with the janitor that the more delicate and strained relations may exist. It is better to have a thoro understanding at once. He should be provided with the necessary tools for his business. If none can be provided, some should be assigned from the shop and the teacher should then let them alone himself. It should be understood that all others from grindstone to drawing instruments are not for his use and that he must not permit any unauthorized person to use them. Such an agreement is the forerunner of peace. Without it there is continual wrangling and loss and injury to tools.

It is not at all necessary for pupils to know at first all details of the course to be followed or all the teacher's plans for the future. It is always better to do than to talk. Some plans may not materalize and the less said about them the better. Children are more interested in the present than in the future. Besides, a few things told at a time

are more easily remembered. So the new teacher does well to spend little time at first in explaining himself. A little outline of the work to be done—just enough to show the pupil that he is headed in some definite direction—is sufficient explanation of the future. Shop rules are immediate and affect present conduct and they therefore need mention. At the beginning is the time to make the situation clear. About all that requires saying about rules should be told on the first day and in a very few minutes. On succeeding days vigorous action with offenders should take the place of admonition so far as conduct and care of tools are concerned. Interest in shopwork is so absorbing that discipline is easily maintained by the teacher who recognizes disorder and insists on observance of the rule that nothing will be allowed to cause loss of time or hindrance to another's progress. A shop will not run itself. The practice of permitting work in the shop in the teacher's absence is not good. Penalties must be inflicted for violations and someone must be present to inflict them. Effective penalties are easily devised, the most effective being those depriving the offender of privileges of the shop.

Such class demonstration by the teacher as is necessary need not take much time. A friend of mine whose skill with tools has frequently guided me has been of less help than he would have been had he demonstrated less and directed my own efforts more. The young teacher if a skilful manipulator is in danger of showing his own skill too much and of developing his pupils' too little. I learned to turn a straight furrow by taking hold of the plow handles and plowing with someone to tell me when I failed. Our experiences with bicycles and skates have been similar. There *is* a place for demonstrations before a class if they are short and are followed up by enough individual criticism of the pupil's work.

Experience shows that a detailed working drawing made by each pupil before beginning on a problem with tools is a saving of time. Progress in manual processes follows closely the progress made in ability to make and read a working drawing. Unless a thoro course in mechanical drawing has preceded this course, more time is lost thru mistakes in interpretations of another's plan than is required to make individual drawings. The process of thinking out each detail as the drawing is made even of a plan copied entirely from another, saves more time at the bench than is required for the drawing. This, of course, is not true of drill work such as simple exercises in laying out,

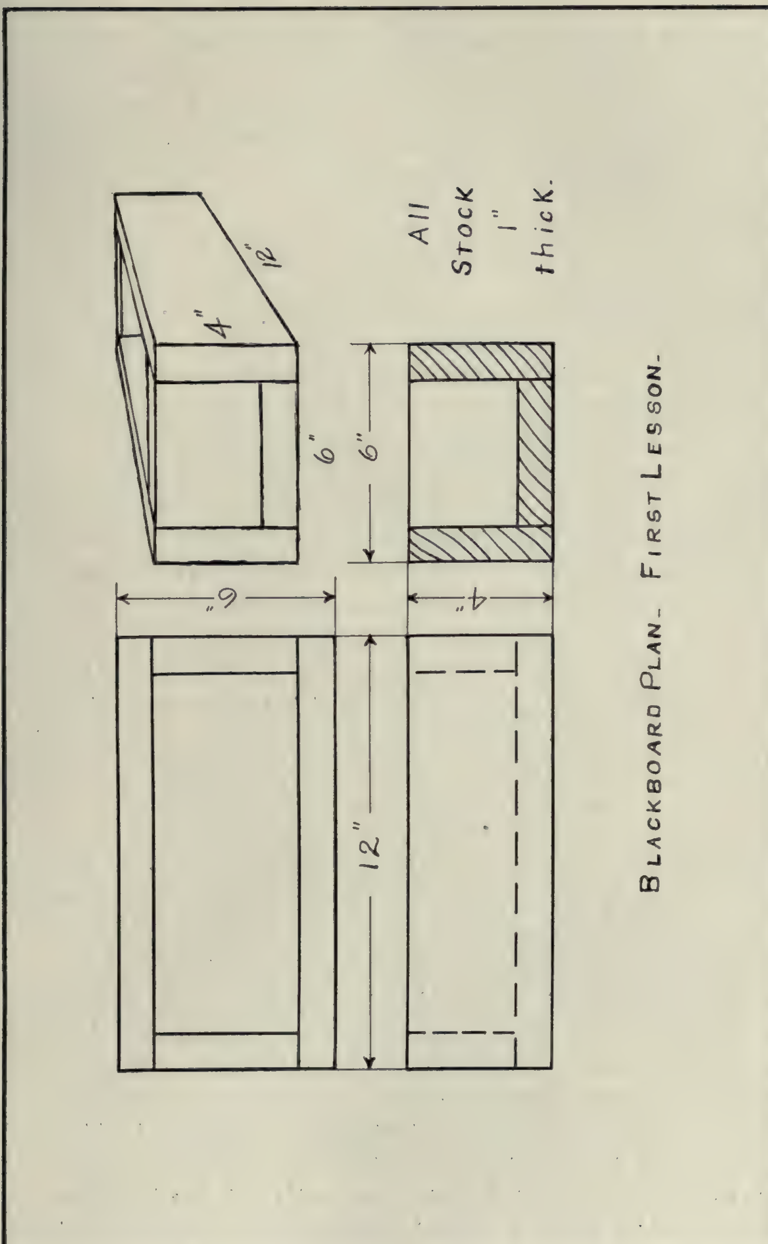


FIG. 5.

planing, and sawing, which are not intended to train the mind to hold a number of details at once. If it is agreed that each problem should be an attempt to construct some definite article to which practice exercises are only incidental, a plan must come first. Young people do not learn to read and work from the plans of others till they have learned to make and use their own plans after continued practice and frequent mistakes.

OUTLINE OF FIRST LESSON.

Assuming little or no previous preparation by pupils in drawing, the steps in the first lesson are outlined below. A plain box fastened together with nails is the problem selected for illustration. The essential elements of a working drawing are illustrated by it, see Fig. 5. First comes the freehand sketch on the blackboard with model in hand; then top, side, and end views rapidly but neatly made and explained. The kinds of lines to show outlines, invisible edges, dimensions, and extensions, are plainly illustrated and easily explained by this model. The use of drawing board, thumb tacks, T-square, triangles, and rules must be taught by directing the whole class one step at a time as they try to make the working drawing after first sketching for themselves a box, preferably of different size and shape from the model used by the instructor. This will be slow work, requiring at least two forty-five minute periods. After the drawing, come the various steps in planing, laying out, and sawing, given as follows: first, demonstration of each new process by the instructor; second, the pupils attempt to do the thing directed; and, third, criticism and guidance by the teacher. The six pieces required, all of the same type, afford ample drill; the different sizes give variety; and the fact that the plan must be carried out skilfully if the product is to be a box that will hold water is sufficient incentive to honest effort. The result may be a failure so far as the test of holding water is concerned and it may not always be necessary to make the test with water to prove the failure. Yet an ideal will have been set up and the necessity of proceeding by correct methods will be fixed. The new teacher who succeeds in turning out from his shop one box from each pupil as indicated, one or two of which will hold water, at the end of seven or eight sixty-minute hours of actual work by beginners, may feel at the first week's end that he has accomplished something in the eyes of his young workmen whose compliment in the family circle will be that "the new teacher is onto his job."

The above sounds simple and easy. It may seem otherwise to the young teacher as he sums up the results of his week's labors. The modest degree of success attained has been mixed with annoying failures. One boy whose natural ability is only exceeded by his michievousness has finished his box before others are half thru and caused disturbance while waiting for more work. Some of the well planned instructions fell on stony ground, else why did several of the class draw vertical lines with T-squares placed cross-wise of the board? Failure to plan orderly ways to enter and leave the shop and lack of system in beginning work and clearing up at the end of the period have caused delay and annoyance. Things have been too chaotic. There have been un-oiled cogs in the wheel with some grating and lost energy. But new names and temperaments and abilities have been learned, plans have been made whereby the more skilful and rapid workers will be given extra and more difficult work involving old principles, and new schemes have been laid whereby the minds of dullards, sent to do shopwork on the theory that mind is not required there, may be circumvented and directed into following simple directions as given and seeing invisible edges in a working drawing.

WRITING DESK OF QUARTERED OAK. THIRD YEAR HIGH SCHOOL. NEWMAN MANUAL TRAINING SCHOOL, NEW ORLEANS, LA.

INEXPENSIVE BASKETRY. III.[1]

WILLIAM S. MARTEN.

AS soon as the first circle is completed it is well to add a few strands to the coil. By continually adding a few strands as the work progresses, the coil should be gradually built up until the desired size is attained, and then continued by adding just enough strands to keep it of an even size.

After completing the first circle the stitches of the second circle will cross to, or be caught upon the adjoining stitches already made in the first circle. Fig. 15 shows the needle in position for the first stitch after leaving the center, and Fig. 16 shows this first stitch pulled up tight. Notice here and in other illustrations how the thread strand crosses the adjoining stitch on the inner circle. This crossing (or catching) avoids any danger of getting loose or slipping. Notice also that the thread is passed not on the outside of the coil but thru the middle of it. This kind of stitch, continued until the basket is completed, is simply made by forcing the point of the needle about midway between the part of the coil adjoining and thru the stitch crossing it, as shown in Figs. 15 and 16. When the second or third stitch of the second circle is made the projecting ends can be trimmed off even with the bottom surface of the basket, as in Fig. 17.

UNIFORM SPACING OF STITCHES.

The space between the stitches will be governed by the size of the basket. Toward the center the stitches will necessarily be close together; but as they radiate from the center, the circle becoming larger, the stitches will get farther apart. Whenever the spaces between the stitches grow wider than they should be, the number of stitches must be increased. If the number of stitches is doubled in the making of one circle around, that is, if an etxra stitch is taken at every regular space between stitches on the inner circle they will be somewhat too close together. An extra stitch taken at every other (alternate) space, for two complete circles only, will double the number of stitches, and at the same time make the spaces more evenly divided. Fig. 18 shows the stitches in the process of being increased. Another half circle around will complete the doubling up process. Since these extra stitches are

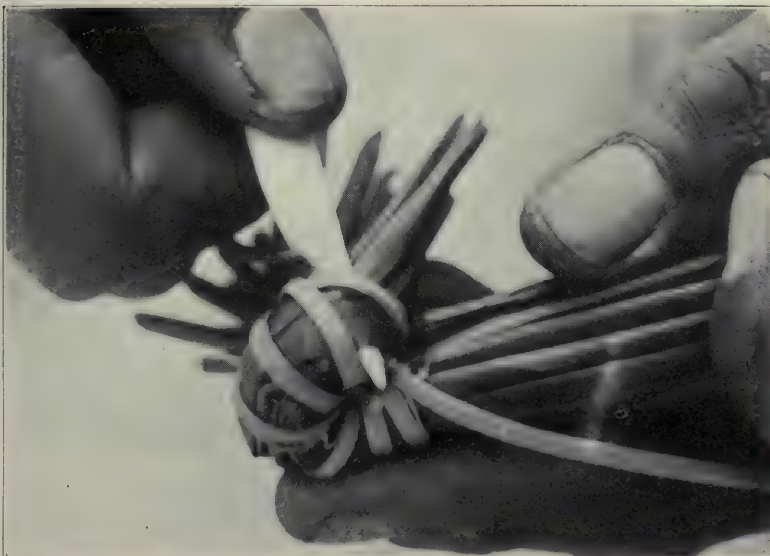


FIG. 15. NEEDLE IN POSITION FOR FIRST STITCH AFTER LEAVING THE CENTER.

FIG. 16. THE STITCH PULLED UP TIGHT.

FIG. 17. PROJECTING ENDS AT CENTER TRIMMED OFF EVEN WITH BOTTOM SURFACE OF BASKET.

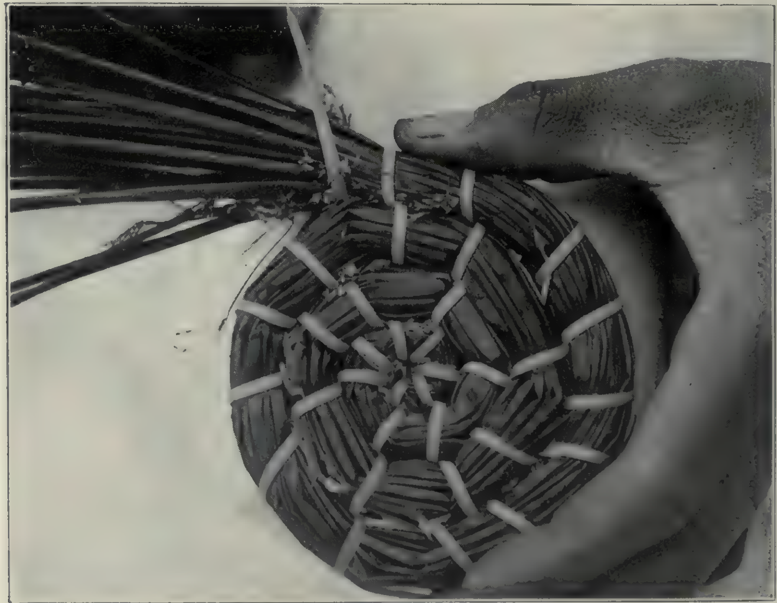


FIG. 18. METHOD OF INSERTING EXTRA STITCHES.

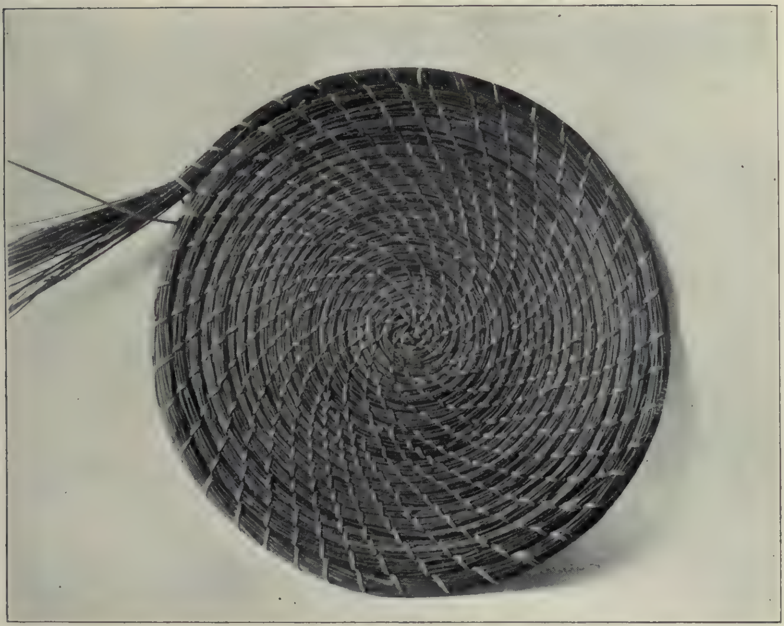


FIG. 19. BOTTOM OF BASKET COMPLETED, SHOWING SPACING OF STITCHES.

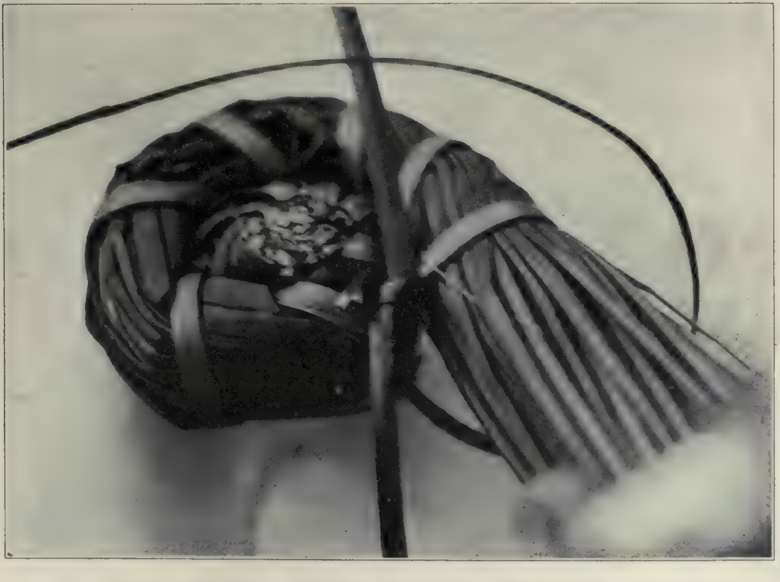


FIG. 20. THE FLAT-LOOP KNOT.

not caught upon stitches of the inner adjoining circle, the spaces are likely to become uneven. If this happens they must be arranged evenly with the fingers. This process of doubling the number of stitches will have to be repeated a number of times before the bottom is completed, as shown in Fig. 19. Special care must be taken that the spaces between the stitches are very regular and of right width, just before turning up the sides of the basket; for it is this spacing that must continue all the way up the sides of the basket. See Figs. 23 and 24. The thread must be kept drawn taut always if a solid firm basket is to be obtained. If the coils are held in correct position with reference to each other the bottom of the basket can be made perfectly flat.

TYING ON A NEW STRAND OF THREAD.

When entering a new piece of thread a loop knot perfectly flat is desired, as in Fig. 20. This knot is very simply made. The first step of this knot is shown in Fig. 21. The new strand of thread is shown black for the sake of clearness. Slip one end of the new thread thru the middle of the coil next to the last stitch taken. This must cross the stitch of the inner circle as shown in Fig. 21. The short end of this new thread is then slipped under the last stitch taken, on the outer circle as shown. Notice that this free end is pointed away from the free ends of the coil. This end is not pulled up tight but a loop is left formed between the inner and outer circles of the coil. The next step to complete the tie is shown in Fig. 22. First bend back and slip thru this loop the end of the new thread pointing inward. Then the end of the old thread which has been held on the outside of the circle, as seen in Fig. 21, is brought back between the inner and outer circles and entered also thru this loop pointing outward. Fig. 22 shows this done and ready to be pulled up tight. This is done simply by pulling on the long end of the new thread. The result should be a perfectly flat knot as in Fig. 20. With a little care this can be pulled down between the coils so as to be hidden from view.

MAKING THE TURN.

The turning up of the basket is made by holding the coil in the desired position and fastening it there by pulling the thread up tight, as in Fig. 23. Any desired shape can be built up in this way. A perfectly

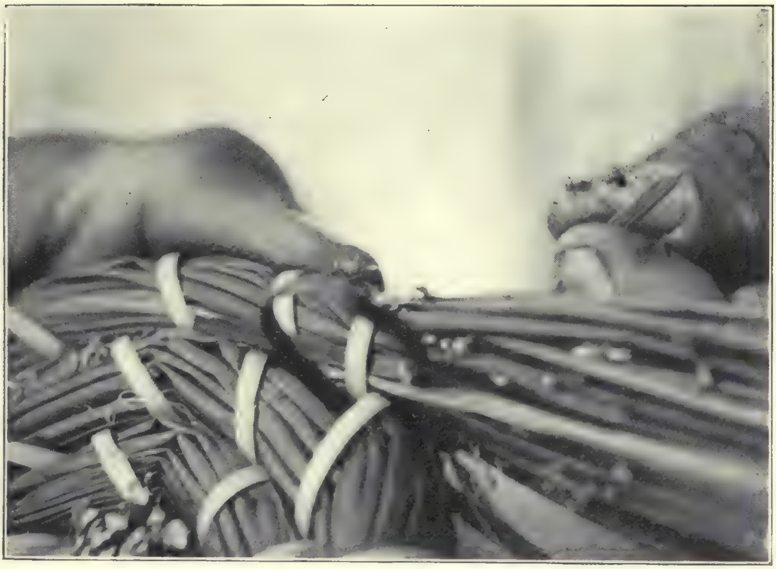


FIG. 21. FIRST STEP IN TYING THE KNOT.

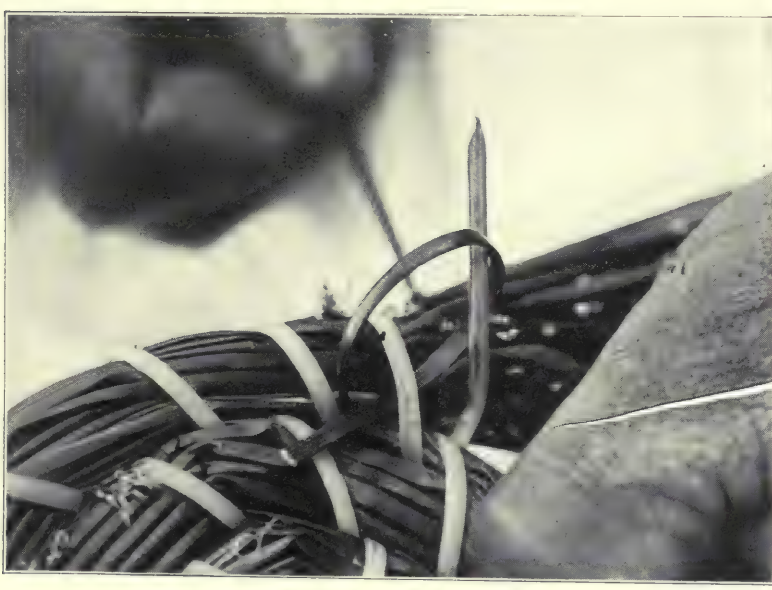


FIG. 22. THE KNOT READY TO BE PULLED UP TIGHT.

FIG. 23. STARTING TO BUILD UP THE SIDE OF THE BASKET.

FIG. 24. BUILDING UP THE SIDE OF THE BASKET.

square corner can be made if desired by simply fastening the coil directly on top or at right angles to the bottom of the basket.

BUILDING UP THE SIDES.

To secure a good, smooth, even shape to the sides, practice and care are necessary. If the outline is not shaping up in just the desired way, if it is turning in or out too quickly, it is necessary to tear down the few coils that are wrong and then correct to the desired shape. To try to correct it by forcing it into shape without rebuilding the coils that are wrong will result in a badly shaped basket.

(To be continued.)

DESK SHOWN ON PAGE 415, OPEN.

DESCRIPTIVE GEOMETRY. I.

H. W. Miller.

IN dealing with the subject descriptive geometry, it is proposed to discuss the rather broad subject of its value to the engineering student, then more specifically its place in the curriculum, methods of presentation, and weak points in existing texts.

Fortunately for the student the day seems not far distant when lack of system, logic, reason, or coordination (whichever one may wish to call it), will no more be tolerated in the composition, arrangement, and administration of the engineering college curriculum than in the administration of the affairs of a great corporation. Indeed it is difficult to understand how the deplorable state of the present curriculum has so long escaped the keen eye of the "public spirited" and "destructive" critic.

Before deciding upon the aim, design, and methods of administration of a number of studies of the curriculum, a general question must be answered: Should an engineer's education be along broadly general scientific lines, or on the other hand should it be highly specialized? The question is, of course, open to discussion, but the writer is strongly partial to the first alternative, for, in a few words, it seems almost absurd to be setting the 5,000 or more yearly engineering graduates of the United States at specialized work that perhaps can be as well or better done by the self-educated engineer, whereas the brains of those 5,000 men might be turned to 100 per cent better account as officers in the army of engineers, managers, etc. A specialist cannot be a manager; his outlook is too narrow. Hence the partiality to the broader education.

VALUE OF THE SUBJECT APPRECIATED.

The great number of texts on descriptive geometry, published during the last decade, and the attention given to the design and administration of the course seem to indicate that tho logic has played little part in the composition of the average curriculum, the advocates of both general and specialized courses have awakened more fully to the value of this subject to the student. Not only is it in every curriculum but it seems to have reserved for itself a very definite place; and definite reasons can be given for this, if indeed they have not already been given.

The writer has learned that in dealing with the general problems of design and administration of courses, for the student, the best results are attained when the students are considered as just so much raw material brought into a factory, to be turned out on the market a finished and salable product. The questions that must be answered concerning them are: (1) What shall be the various operations in the student's development? (2) What shall be the purpose of each? (3) What machinery and methods will produce the desired results with the highest degree of efficiency, both in quality of finish and amount of waste or scrap?

Number one can best be answered by merely stating the actual factory operations: *a.* Preparation of material for further operations, (annealing, etc) ; *b.* Formative or constructive operations; *c.* Finish.

It seems to be the consensus of opinion that whether the course be general or specialized, the work included in operation *a.* (Preparation), should be practically the same for all branches of engineering. Curiously enough, however, a question has arisen, and it is still a question, as to whether descriptive geometry should be classed with subjects of operation *a.,* that is, as an educational mathematical study, or with group *b.,* i. e., as formational, or a study given for the value of its practical applications. The adherents of its classification as an *a.* study, of course, make it mainly theoretical, giving graphic problems in theory by the hundreds, while the advocates of the other classification would insist on problems of a practical nature, in short a combined course in drafting and descriptive geometry theory.

The writer has long since decided, to his own satisfaction at least, that if practical applications are to have weight in classifying a study, descriptive geometry has no practical application. The fact is, that before a student graduates, his knowledge of descriptive geometry is so interwoven with the other work he has taken that not for an instant does he give the credit of the many indirect applications to descriptive geometry itself.

In three years work in boiler and construction shops, in laying out iron for boilers, marine type, firebox and vertical, for all sorts of odd shaped joints and pipes, dumping cars, the writer found it an absolute necessity in turning out work rapidly, to discard theoretical and use approximate methods that men of the shops with plenty of "horse sense" understood and used as well as he.

It seems curious that we should feel compelled to give a student some practical applications as reasons for 90 per cent of the subjects he

is taking. He never thinks of asking for a practical application of German or rhetoric, yet as soon as he takes up a study in the least technical, he demands, and we feel compelled to give him, practical reasons for it. This may be proper with many subjects but surely not so with descriptive geometry. Why not tell him that is is given to teach him to think logically, to reason instead of to guess? The course can be made just as interesting to him under that assumption as any other.

FUNDAMENTAL PURPOSE IN TEACHING DESCRIPTIVE GEOMETRY.

The student's mind comes to us a very illogically operating piece of mechanism; given a problem, it is as likely as not to assume the desired result as an axiom and proceed with the explanation without a thought of the absurdity. When asked a question, not even 10 per cent. of the members of an ordinary beginning class will give a direct answer, and the plainest of orders cannot be correctly executed by more than 50 per cent. of first year students. All of the above are occurrences of the commonest kind, and are met with daily. The illogical student must somehow be taught the laws of coordination; he must be shown that in any problem, whether theoretical or practical, there is a first step in the solution as well as a last, likewise a second, third, and fourth. Until the student becomes such a logical worker, and appreciates to the full the value of this ability to analyze the solution of any problem, and sees that this ability is the real asset of the engineer, little progress can be gained in teaching him the formative subjects in his course.

For the purpose of systematizing the student's mind no subject could replace descriptive geometry. It is essentially an analytic study, dealing with abstract problems, it is true, yet problems in which are involved points, lines, and planes, so common and familiar to us all that they eliminate the indefiniteness of the abstract. Neither trigonometry nor analytic geometry could replace it, for both are merely preparations for higher mathematics; there is not so great necessity for analysis in either.

The value of descriptive geometry perhaps lies in the fact that it deals with problems whose solution can be reached by only one road; for example, the general problem of determining the distance from a given point to a given plane. A score of graphic variations of this problem can be given, no one variation having to the eye the slightest resemblance to any other. The student immediately recognizes that it is useless to memorize a picture of one solution and expect to solve the remainder from this picture. What then shall be the process? It is

found that in space or in the abstract there is a common solution and that it is divided into three distinct steps, 1, 2, and 3, and that in solving any one of the problems these steps are with few exceptions identical; yet it is absolutely necessary to proceed with them in the order of 1, 2, and 3. If then for even half a year, day by day, a student is drilled on problem after problem, with all possible variations, made to give orally the theoretical solutions or analyses until he has them all ready at an instant's notice, and is able to apply them and explain the applications, he has been wearing ruts from which his mind cannot escape. He continues this course of analysis from force of habit. The student dissects his daily work, recognizes the good and keeps it and throws away the bad; he analyzes unconsciously every problem he meets to determine where he should start in its solution and how procced. Other studies strengthen and increase the value of these habits. When he leaves school he finds that just this ability serves him most. Seldom will he find a job, the details of which are familiar to him; he must learn more; however, this is now comparatively easy, for, breaking up the unfamiliar job into its elements, he finds that he is familiar with the elements. He is not long in gaining confidence in himself and his ability to "see thru things."

POSITION IN THE CURRICULUM.

The fact that descriptive geometry now, in point of time, has in the various institutions a choice of five positions in the curriculum, namely, the last two years of a four-years' high school course, and the four semesters of the freshman and sophomore years of college, brands the matter of choice of position a question for discussion. From results of experiments and from observation, the writer has come to the conclusion that there is just one definite place for descriptive geometry and only one, if the best results are to be obtained.

The choice of position in the curriculum of any study is, of course, primarily governed by its aim. The aim determines the nature of the course, that is, just what shall be given and what omitted; and the nature of the course determines the methods of administration to secure best results. So back of all of the details of any study, whatever their nature be, should be found the one controlling factor, "Aim."

Once this aim is decided upon, in designing the work, the question of extent of time over which the course is to run must be considered.

In this consideration, a fact gained from experiment becomes a strong factor; that is, assuming the course to be mainly educational, a course in logic, experiment proves that to reap the greatest benefit from a course in logic, the line of work must be pursued fast and furiously; short periods of work or a straggled out course thru a whole year are fatal to the deep interests of the student, hence to the value of the course. The study has hence been made very generally a one-semester course; perhaps 200 hours would be a fair average of the time required, including preparation, recitation, and drawing room.

With the aim and time length of course determined, the design may be completed and the question of position in the curriculum met. The only direct prerequisite of descriptive geometry is, of course, solid geometry. However, other things than prerequisites have so strong a bearing that it would not be safe to assume a student ready to undertake the course immediately on completion of solid geometry. The aim being to make the study a course in logic, demands that it be given as early as possible in the college course so that the benefits may affect the greatest amount of subsequent work.

The remainder of this discussion is merely a summary of results of experiences during several years, with classes of about 450 students in the department of General Engineering Drawing at the University of Illinois.

For a number of years a certain standard text was used in a course of approximately 225 hours of inside and outside work, extending over a period of one semester of eighteen weeks. During that time the student solved about eighty plates, each containing from five to six problems, in all about 400 problems, and from comparison, one of the stiffest courses in the country. The failures ran from 15 to 20 per cent. Certain changes in the administration of the course, with the same text, dropped the failures to 13 per cent. A change of text, with the same course, dropped the failures to 2.5 and 2 per cent. during two successive trials, and is at present producing like results. In all these instances the courses were given in the second semester of the freshman year, as a parallel study with analytic geometry, the students having completed algebra and trigonometry during the first semester.

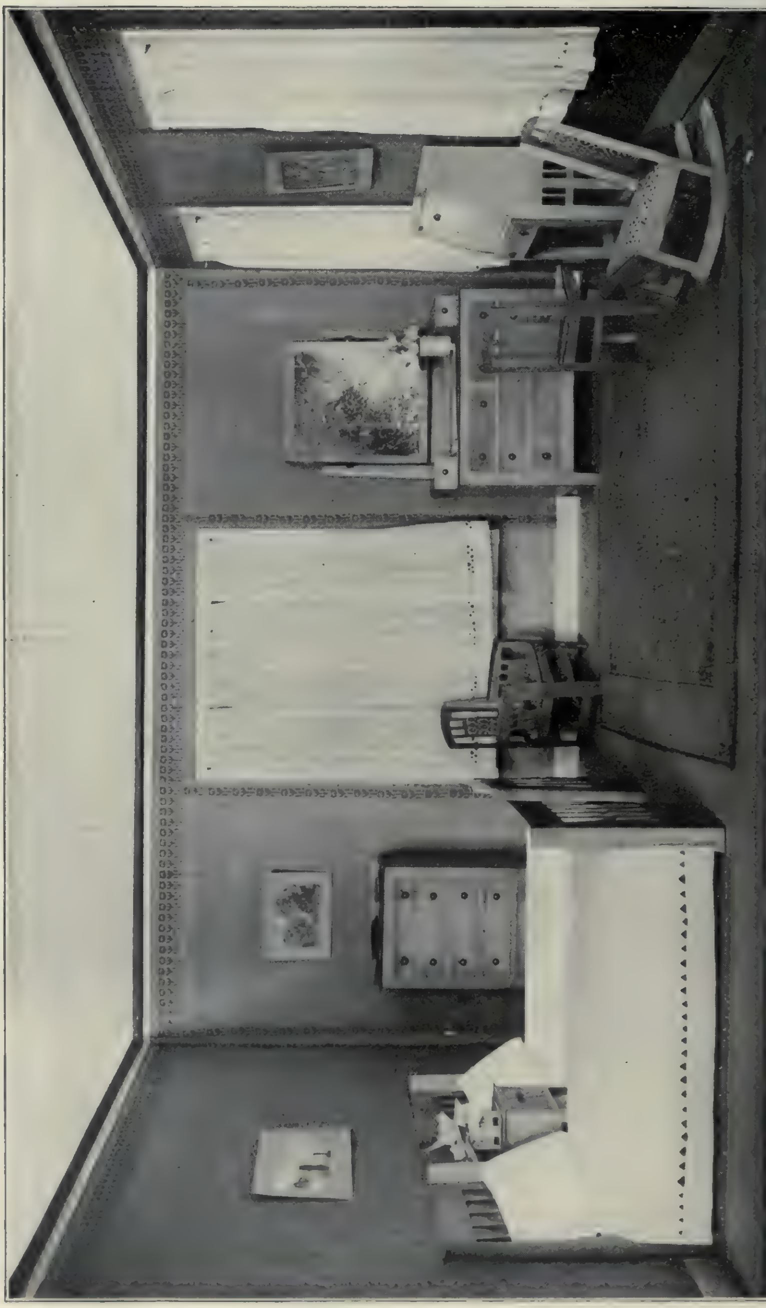
To accomodate a readjustment in the schedules of the Department of Architecture, their students were given the descriptive geometry during the first semester of their freshman year; i. e., as a parallel study with their algebra and trigonometry. To our surprise, it must be said, the

failures jumped to 13 per cent. using same text and same course. It likewise happens that all of the instructors who were in charge of those students are thoroly experienced men. After a thoro investigation of the surprising results they could conclude nothing but that the students were not sufficiently developed in a general mathematical sense, for such a course. The algebra and trigonometry are of course not prerequisites; however, the completion of these studies apparently does mark a distinct point in the student's development as far as his ability to master descriptive geometry is concerned.

In summary, descriptive geometry as an educational study should be given as early as possible in the college course. It should be a one-semester course of at least 225 hours. Experience has proven it unwise to give it as a parallel study with algebra and trigonometry. And the fact that one of the heaviest of existing courses has been repeatedly given with a failure list of not over three per cent., as a parallel study with analytic geometry, seems to indicate that as its one and only proper place in the curriculum.

(*To be continued.*)

MISSION LAMP—ORIGINAL DESIGN SAWED IN WOOD. TENTH GRADE, ROCKY FORD, COLORADO.



ROOMS IN PAPER—BED-ROOM.

ROOMS IN PAPER.[1]

PROBLEMS IN CONSTRUCTION AND DESIGN. III.

NAMA A. LATHE AND ESTHER SZOLD.

THE room or stage for the furniture is made of thin wood. It consists of the floor and three walls showing such window and door openings as may be desired. Accepting gracefully the limitations of any stage, these walls are planned to accommodate the furniture of the room comfortably. It may be tactful to imagine that some of the doors are in the missing wall. This explains the absence of doors in the bed-room and living room.

In building the stage, place well-shaped cleats at the ends of the walls, around the top and bottom of the frames, and around the window and door openings, to help prevent warping, to provide a finish for the edges, and to serve as window or door casings. Except where the paper is to cover the walls, the entire stage should be stained according to the color scheme chosen. Picture-moldings and baseboards may be strips of manila paper such as is used for the furniture, stained to match the woodwork, and mounted after the wall paper is hung.

The decoration of the room naturally begins with the larger spaces, hence the treatment of the walls is one of the first things to decide. In the schoolroom, various means of wall decoration are discussed, pictures of beautiful rooms, and samples of well-designed wall-paper shown. The interest may extend to famous frescoes, mosaics, and mural paintings, but even the most humble walls may be beautiful, if clean, and harmonious in design and color. A wall in a home must be the background for the pictures, furniture, and people. Its chief structural elements are that it is vertical and has a flat surface. So the effect of the main tone must be flat, and if the surface is decorated the value of the decorations will not vary greatly from the main tone. On the higher parts of the wall and wherever its function as background ceases to be essential more decoration is appropriate.

We chose plain papers for the walls in our rooms, relieved in the upper portion by decorations. To obtain the desired color for the walls

ordinary drawing paper may be tinted, but if a lining or unprinted wall-paper can be procured one may paint it in larger sheets and its texture is better. For such a large surface prepare a saucer of the desired color, use a broad brush and paint sufficient paper for the whole room from the same dish of paint.

One problem in teaching design is to develop appreciation of fine relations of figures to background, and of shapes and spaces within the unit. One bar to this development is the time and effort involved in making sufficient variations in the unit, and enough trials of different repetitions to afford generous opportunity for comparison and selection. Stencils and wood blocks help to make such experiments possible but are too difficult to cut and manipulate to be practical in an ordinary schoolroom. When cut for the pupil he has no opportunity to vary the unit itself. In the designs as applied in our rooms the scale is an additional barrier, requiring smaller patterns than can be cut easily in either stencil or wood block.

THE POTATO STAMP.

The common Irish potato comes to the rescue. A stamp made from its solid starchy mass is easily cut, endures a deal of pressure and prints readily upon paper. Using the potato stamp is the same process as using a rubber stamp with an ink pad. A satisfactory pad is made of three or more thicknesses of washed cotton cloth laid smoothly in the lid of the paint box. For experiments in spacing this may be saturated with ink. For application, the pad should be saturated with water-color. A drop or two of liquid glue in the mixture gives more body to the paint and is necessary if a very dark color is desired. A few trials with the stamp upon the paper will show how moist the pad needs to be, and what pressure is necessary for a clear print.

To make a potato stamp, cut a block of potato with one smooth face. Remove the roughness due to the grain of the potato from this printing face by rubbing it upon a paper laid on a smooth surface. When this prints satisfactorily cut away the edges to make the general shape desired for the unit. With the potato, pupils may design in terms of the medium and the tool. The variations which it is possible to make by simple cuts in the surface of the stamp are an inspiration to a hesitating designer.

A, B, C and D, Fig. 19 show evolutions of stamps made in this way. It is fascinating to experiment with different repetitions of the

same unit, each new combination suggesting new possibilities which should be tested, judged, and the best applied. Fig. 19 and Fig. 20 are reproduced from designs printed on paper with potato stamps. Those marked with the same letter are printed with the same stamp.

When one is familiar with his tool and desires finer proportions and more accurate workmanship the design may be planned with pencil on paper. Prepare a printing surface, test, and clean the surface by rubbing on flat paper. To transfer the design to the potato, paint the design with common writing ink, allow it to dry, and when dry press the moist, cleaned printing face of the block upon the design, removing it very quickly. If the print is blurred the stamp has been left too long on the design. If so, rub off clean and try again. Cut away the white portions from the surface. Several colors may be used in one pattern by cutting a stamp for each color. In Fig. 19 and Fig. 20 no attempt was made to show two tones in any design. Altho the potato blocks are not permanent, we have found that one is sufficiently durable to do all the work required of it in one room. If necessary, blocks may be kept for two or three days if laid on a moist cloth in a small covered box.

APPLICATION OF DESIGNS.

The many problems in design involved in the development of a room are not only interesting and valuable in themselves, but are doubly educational because each must be considered in relation to the whole. To be sure, in working on such a small scale only the large masses of the pattern can be shown, which reduces the design to its simplest terms—a desirable thing for young designers.

When the design has been chosen for the wallpaper it should be stamped upon the tinted ground before that part of the paper is hung.

For our rugs we used cover paper, like Royal Melton, chosen for its weight and general tone. The floor, like the wall, is a flat surface so the finished rug must look flat. It may be viewed from any direction so must look right from any angle. In some of our schools the design was drawn with colored crayons upon a diaper lined in lightly with the pencil. In some, a stamp was used. The former gave better texture, the latter was more rapid. A combination of the two, by stamping the pattern and afterward working a flat tone of blended colors over the entire surface gave a very good effect. After such a problem in design it was interesting to see the pupils, of their own accord, bring

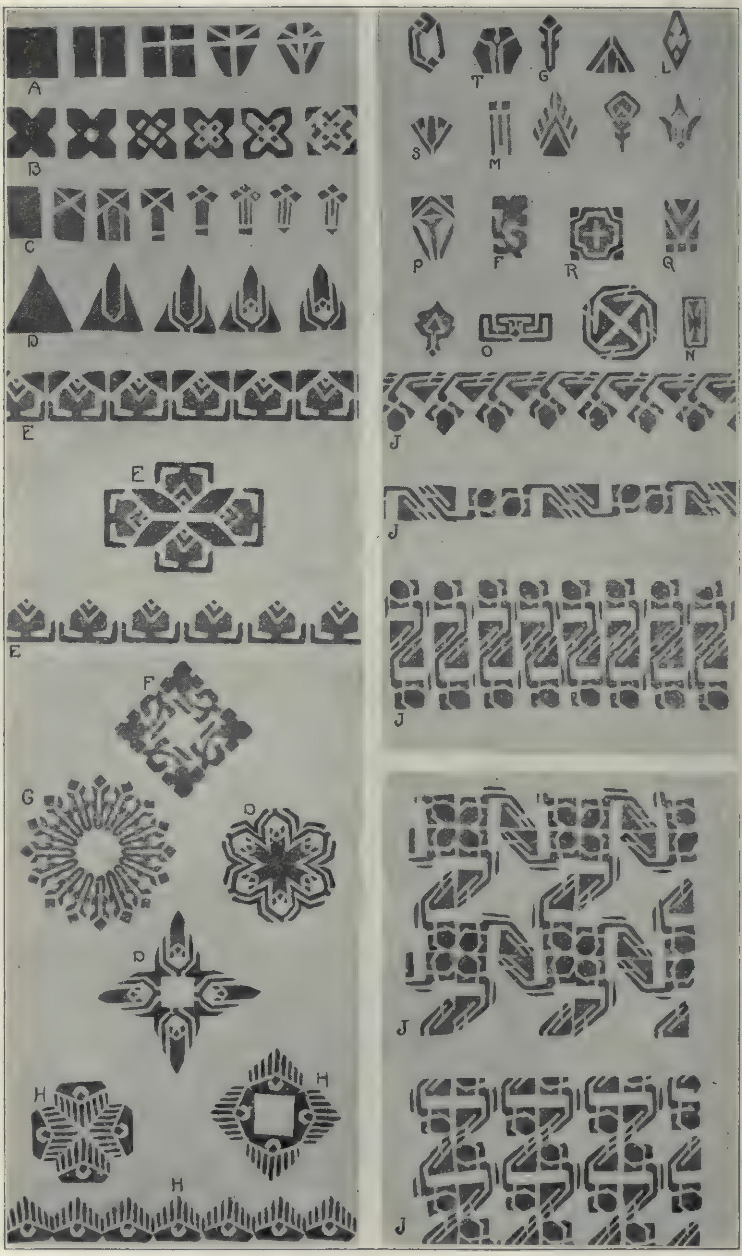


FIG. 19.

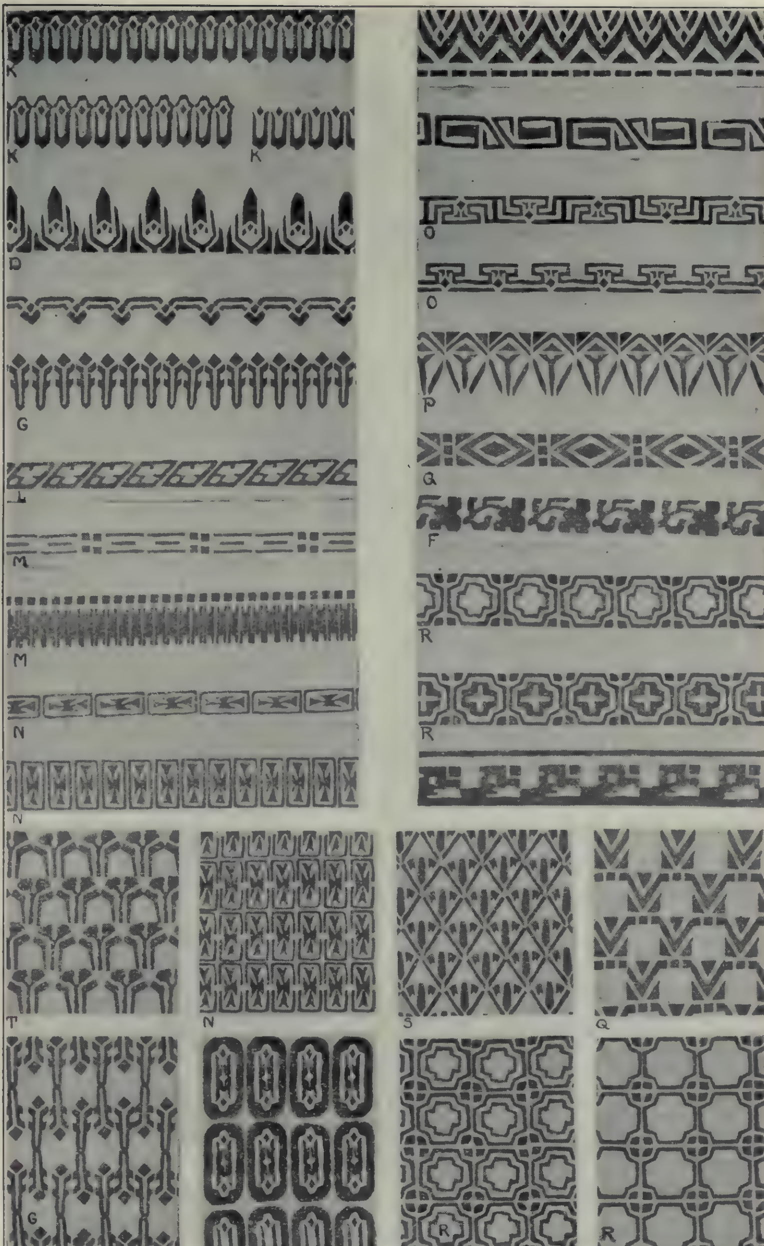


FIG. 20.

catalogs of rugs to school, and encouraging to watch them poring over the catalogs at intermissions, giving barely a glance at the showy rugs of realistic animals and flowers, but examining intently and with evident appreciation and pleasure those with quiet colors and well-ordered design.

The best curtain material we have found is a fine silky ecru toilet paper. White tissue paper makes too solid a white spot at the windows, except in a room decorated in very light colors. The curtains may be decorated with the potato stamp as shown in the living-room (see October, 1911, number), or by pleating and cutting as shown in the dining-room (see February, 1912, number) and in the bed-room. When the paper has been decorated, trim to the right proportions for the window, allowing 3/8″ for a "hem" at the top. Fold the hem, pleat the curtain lengthwise in fine straight pleats. Perforate the hem by pushing a crewel needle thru it while pleated. Remove the needle and insert a fine spool wire as a gathering thread. This wire becomes the curtain rod and the ends are wound around brads driven into the upper casings for curtain fixtures.

Pillows are filled with cotton. Make pillow covers of tissue paper, and decorate by stamping or by cutting patterns from harmonious colors of tissue paper and mounting as applique. In these small objects touches of very brilliant color may be used. Tissue paper, folded and cut in fine patterns represents the lace-edged pillow slips for the bed-room.

Decide upon the shape of runners to fit the different places where they are desired. Cut them from paper of appropriate color. Use the stamp to apply the pattern. Chinese white paint, applied with the brush to white linen writing paper suggests white embroidery upon white linen. The boys in the room were the first to suggest that white embroidery was most appropriate in the dining-room: "Because it can be boiled." Abstract designs were deemed most appropriate for dishes. They were planned with a pencil and applied to white plate paper with water color in a pen or by using a fine tooth-pick for a pen.

BOOKS.

In the book-cases, strips of ordinary corrugated brown paper, such as is used in packing glass globes represent the rows of books. Mark across the ridges with a pencil, to suggest titles and publishers' stamps, then tint with water color to represent different colors of binding.

To make separate books use oblongs of strawboard, cut the right size

according to the scale. Glue together enough for the thickness of the leaves. On thin strawboard, trace around this block and cut two slightly larger oblongs for the covers, glue in place, and paste a strip of thin cover paper over the back for a "binding." See Fig. 26A. Tint the strawboard with water color. The effect is very pleasing, suggesting elegant old leather-bound volumes.

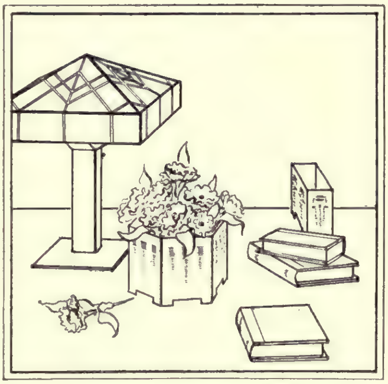


FIG. 26A.

PICTURES, VASES, AND FLOWERS.

For the joy of our room we selected colored pictures, which we found of suitable size in the Applied Arts Drawing Books, in catalogs of Rhine Prints and in magazines. Perry pictures of the one-half cent size are a little too large, tho they may be used if nothing better is available. We will choose pictures for our home which are good to live with, which are inspiring, restful, cheerful, or simply beautiful. Also, the shape of the picture must be appropriate to the space in which it is to hang in order to give the greatest pleasure.

To frame a picture: On the heavy manila paper draw an oblong the size of the picture. Draw the width of the frame outside of this. Cut on the oblongs. Cut another oblong a trifle smaller than the frame, for the backing. Glue a string upon the back for a picture wire, placing it horizontally near the top of the oblong. Stain or gild the frame to harmonize with the picture. Glue frame, picture and backing in place. Hang the picture on two thumb-tacks pressed into the wood. The picture should hide both the string and the tacks.

The forms of the vases are naturally limited by our material. Flower boxes, cylinders, truncated cones or pyramids are suitable shapes. The designs are painted. The subordination of the decoration to the purpose of a vase, and the fitness of the design to the form on which it is painted may be taught in a very convincing manner. See photographs of rooms and Fig. 26A.

To make the flowers, cut brightly colored tissue paper into strips

about one half of an inch wide, double these several times and cut into approximate squares. With a fraction of a drop of glue upon the head of a pin, thrust it thru a small square of green or yellow tissue paper.

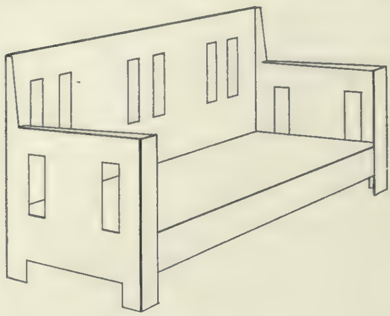


FIG. 21A.

Twist the paper about the head and snip it off close. Thrust the pin thru one or two larger squares of flower-colored tissue paper. Crush the paper about the head of the pin. For leaves cut longer strips of green, put a speck of glue on the pin, and attach. See Fig. 26A.

The pin makes a stiff stem but its weight helps to hold the flowers in the vase. If the pin is too long its point may be cut off with a pair of wire snips. The botanical classification of these flowers wouid be extremely difficult but the spirit of joy which emanates from the bright color of a boquet of blossoms is caught in these brilliant flowers, and they add the touch of suggested life so necessary to any satisfactory room.

DICTATIONS.

In this number the directions for making the furniture have been very much shortened. Several of the forms are so similar to some type given in the February, 1912, number that if directions showing the order of steps in construction are desired they may be found there. We recommend working as far as possible without the dictation. The piano is a model which would not naturally be attempted until some skill in reading a drawing has been attained. We have continued to give detailed directions wherever a new process is involved.

DAVENPORT.

The same order may be followed in the construction of the davenport as that outlined for the arm chair. Follow the drawing, Fig. 21 and note the relation of parts shown in Fig. 21A.

Pasting—Double over the top strip on the back of the frame and paste against the back.

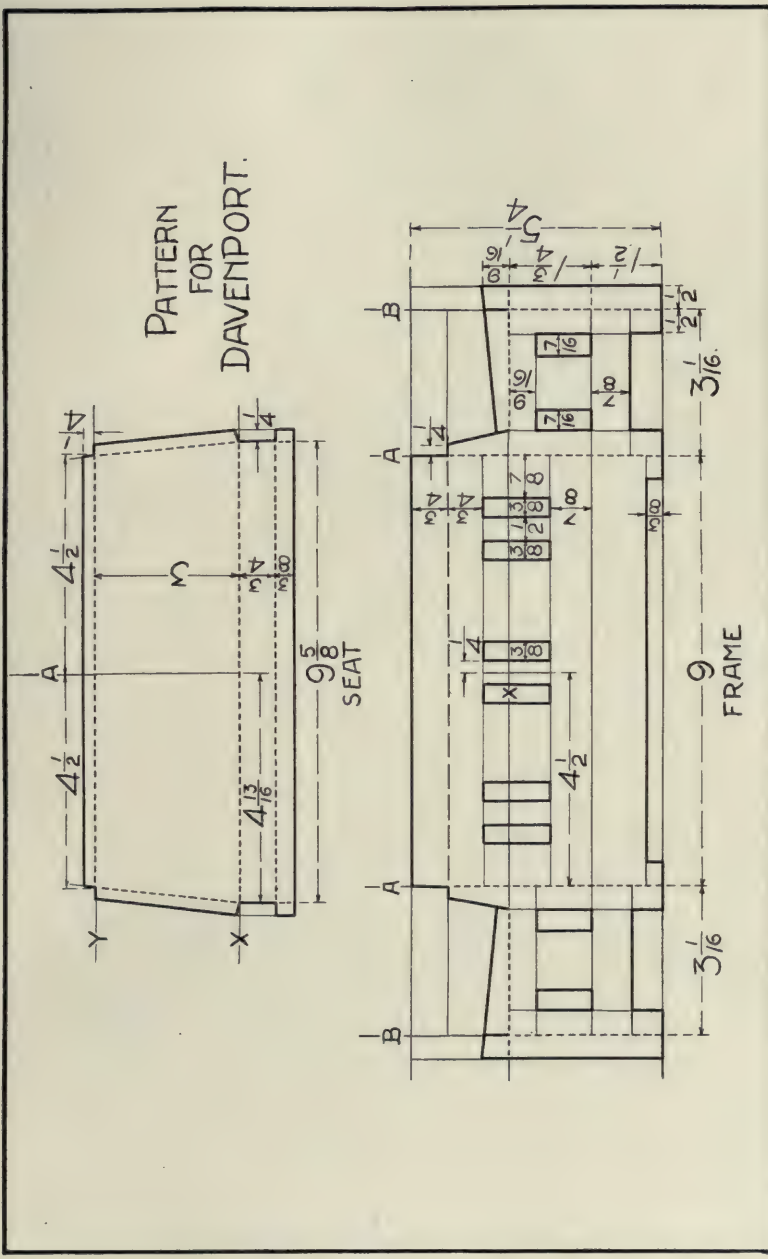


FIG. 21.

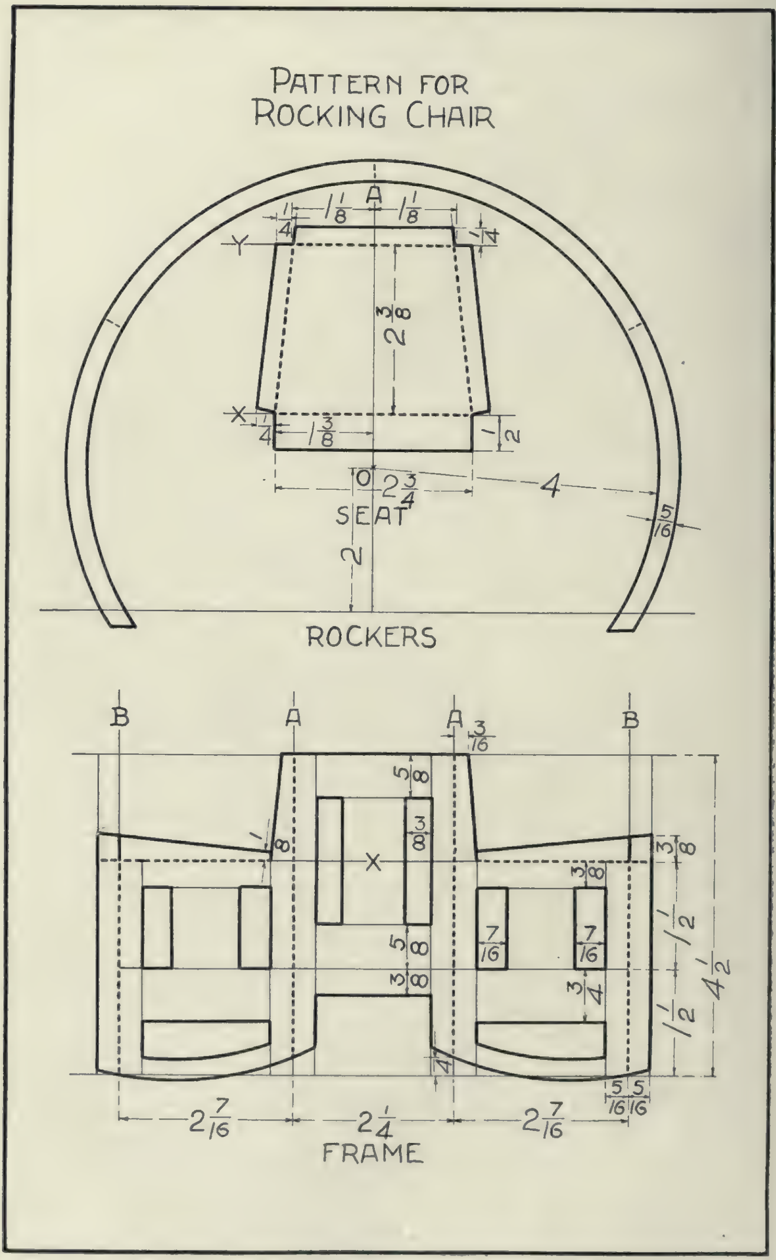


FIG. 22.

The lowest strip on the front of the seat is pasted under at right angles with the front rail to keep the latter from warping.

ROCKING CHAIR.

The same order may be followed in the construction of the rocking chair as that outlined for the arm chair except as noted below. Follow the drawing Fig. 22 and note the position of parts shown in Fig. 22A.

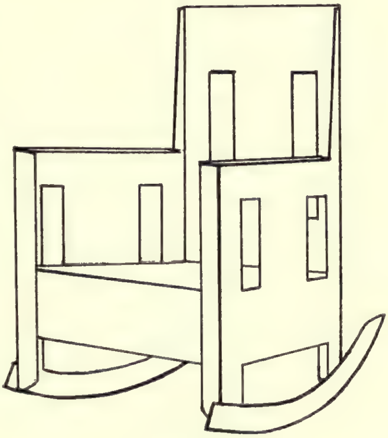


FIG. 22A.

Rockers:

Paper:—7½″ x 9½″. Long edges horizontal.

Base line:—¼″ from the bottom of the paper.

Center:—Mark a point 4¾″ from the left end of paper. Erect vertical A. at this point. On A. mark a point 2″ above the base line as at O.

Arcs:—With the compasses set at 4″ radius draw an arc with the center at O. See Fig. 22. With the same center draw another arc $\frac{5}{16}$″ outside of the first one.

Final Details:—Cut on both lines very smoothly. Fold the curving strip thus formed into four equal parts. Cut at folds. Paste together in pairs to form two stiff rockers.

Rocker Rails:—On verticals A mark points ¼″ above the base line. See Fig. 22. Lay a rocker at the bottom of one side section with its lower rim touching this point on A and the base point on B. Trace along the upper and lower edge of the rocker forming the curving base of the side section. Repeat on the other side section.

PIANO BENCH.

The same order may be followed in the construction of the piano bench as that outlined for the library table without the drawer. Follow the drawing Fig. 23 and note the relation of parts shown in Fig. 23A.

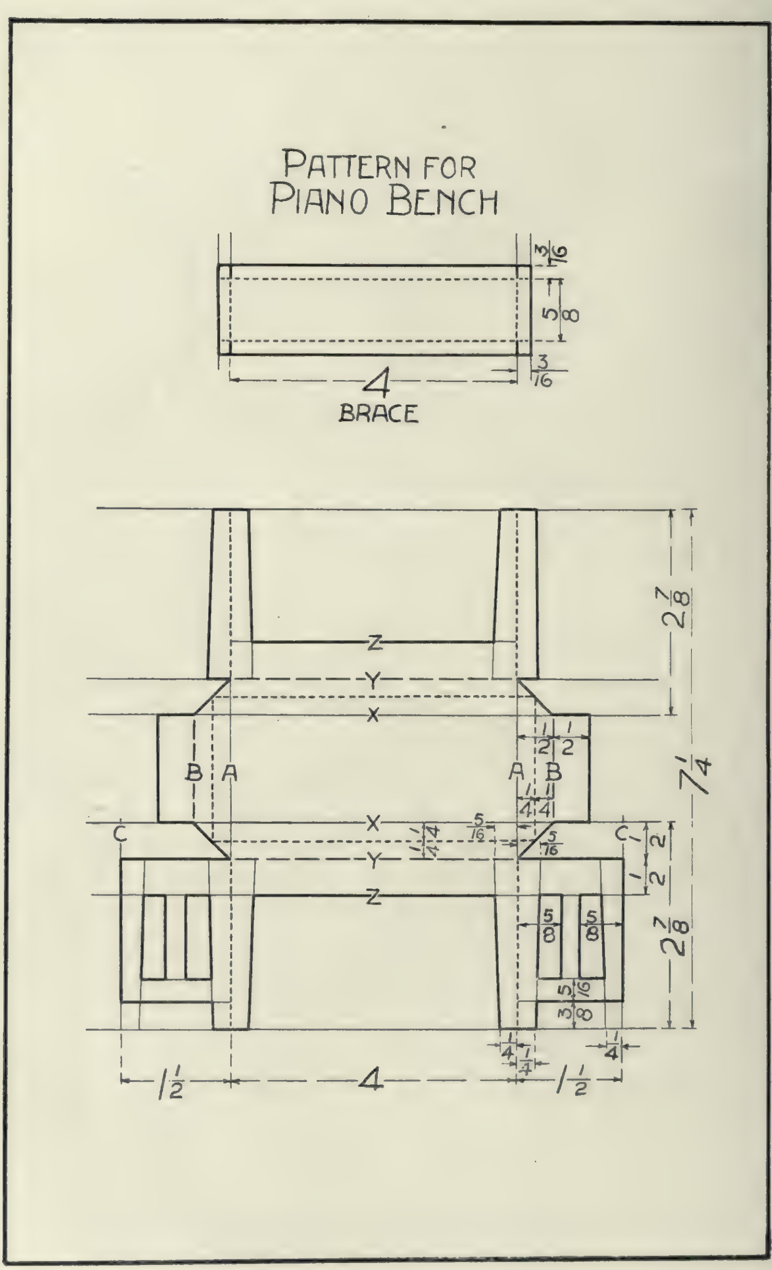


FIG. 23.

PIANO.

See Figs. 24, 25 and 24A.

Follow the general order indicated in previous patterns. Place the base line, erect and test verticals. Work from the main structural lines to the details.

A decorated case is shown in Fig. 24A. If a similar form of decoration is desired, plan it in an oblong about ⅞″ x 1¼″ and trace pattern in position indicated in Fig. 24. The pattern may be cut from the paper, as in fret work, or penciled in heavily to show thru the stain. If penciled, reverse the folds in the case.

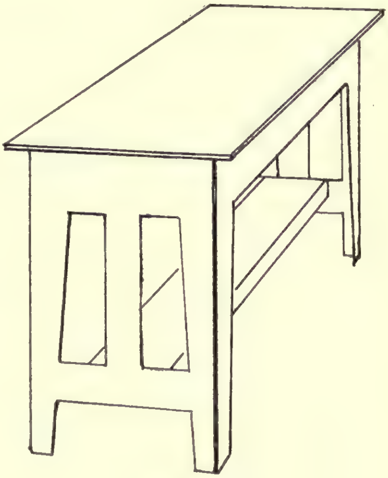


FIG. 23A.

Make the key board, see Fig. 25, of white paper. Use the pencil for marking in the black keys and for lines to separate the keys.

Order of pasting:—Examine Fig. 24A. Fold the parts of the pattern as shown in Fig. 24 and Fig. 25, and assemble them as shown in Fig. 24A. The brace does not show in the perspective drawing.

Paste the case.

Place the music-rack even with the top of the front of the case, adjust to the middle and mark its location with pencil. Spread glue on the marked upper margin on back of rack and paste in place.

Paste one side of the brace with the lap turning downward, just inside the lower edge of the front of the piano. Leave the back edge free until after the key frame is attached.

To paste the key frame:—See Fig. 25 and Fig. 24A. Double back the ¼″ horizontal strip at the top of the drawing as the scoring indicates and paste against the adjoining strip.

Paste the ½″ square laps at the corners of the side sections under the ½″ strips folding over them.

Hold the key frame upright with the keybed turning forward on X. If folded as indicated the sections of the keybed form two steps. Fold

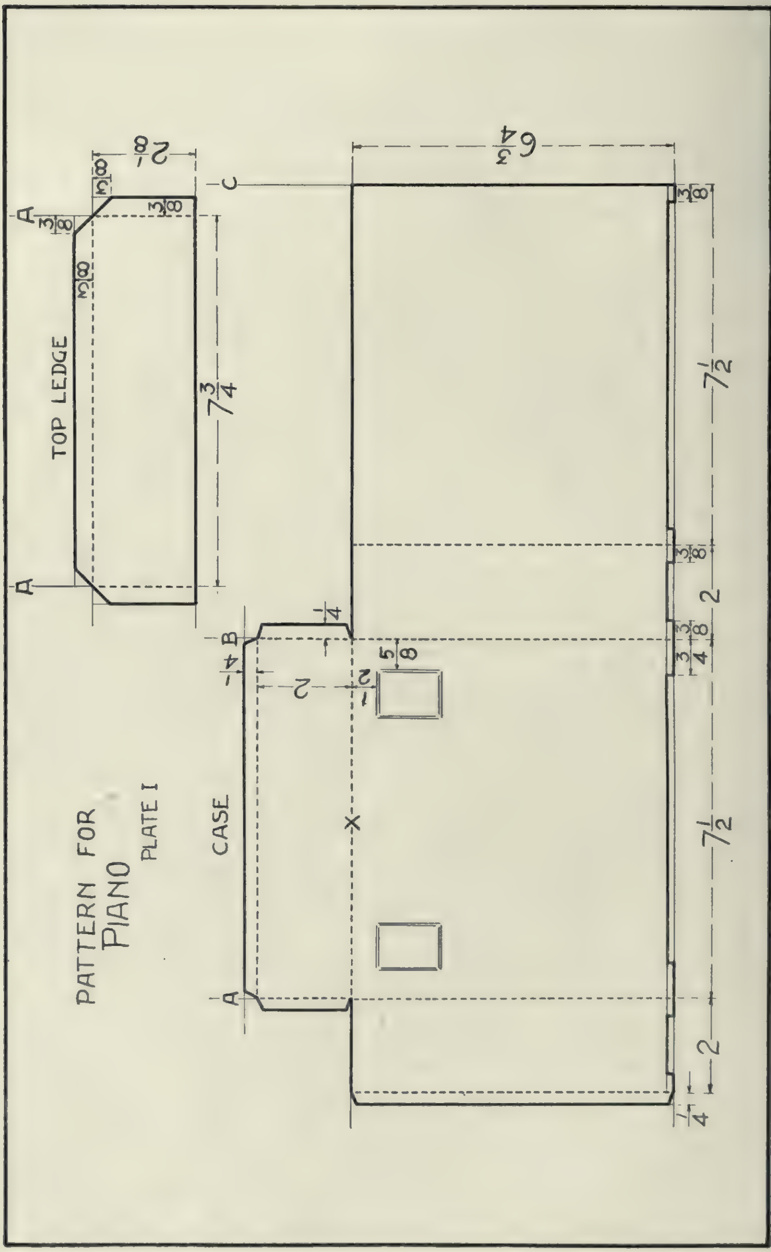


FIG. 24.

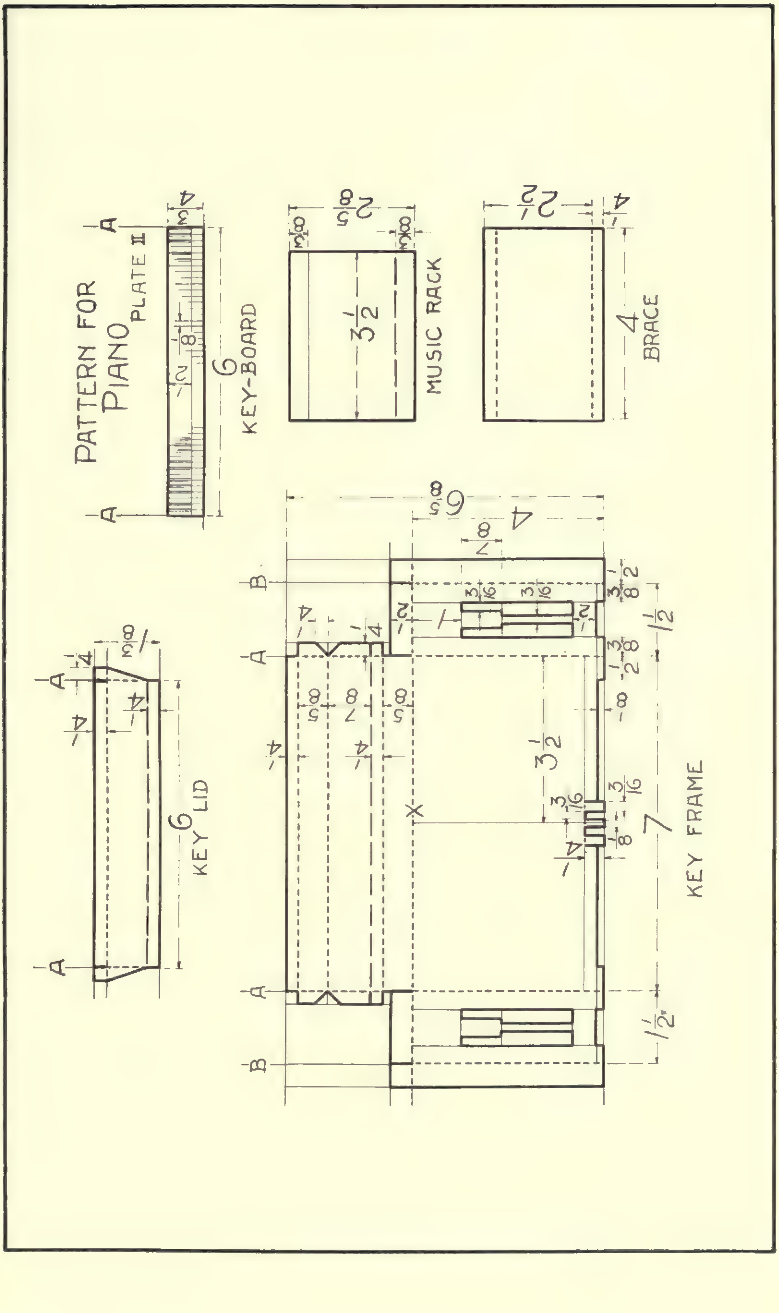

PATTERN FOR PIANO
PLATE II
KEY-BOARD
MUSIC RACK
BRACE
KEY LID
KEY FRAME

FIG. 25.

the side sections forward with the ½″ strips at the top slipping over the top step of the keybed. Adjust steps so that the tops are level and note their position carefully. Where possible mark lines to guide in gluing.

Spread glue on all laps along one side of keybed section, and along that part of the top level which slips under the top strip of the side section. Paste in place. Repeat with the other side. Adjust key frame to the front of the case, so that the inner notches of the feet on the frame fit those of the case. Mark position, glue in place.

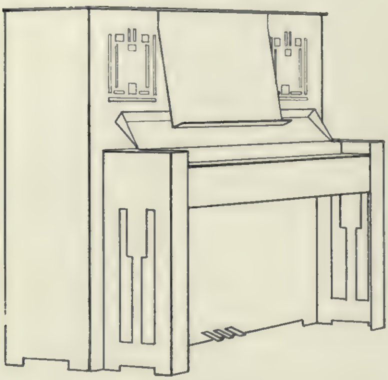


FIG. 24A.

Keylid:—Paste small square laps on the sides of the key lid under the front rail of the lid. Hold the lid in place on the key bed with the front rail turning forward. The lid should fit on the ¼″ rise of the key bed. Spread glue on the back of the hinge and paste in place.

Top ledge:—Double laps under and paste. Paste the ledge on the top of the piano case, with doubled edges projecting on front and ends.

Paste loose lap of under brace to inside of back of case.

Stain the piano.

Paste the keyboard in place.

LAMP.

ORDER OF CONSTRUCTION.

See Fig. 26 and Fig. 26A.

SHADE.

Paper:—Tough water color paper 5″ x 5″. Gaging only with the eye, mark the center of the paper with a fine point as at O.

Set the compasses at a radius of $1\frac{5}{16}''$ and draw a circle with the center at O.

Mark a point anywhere on the circumference. Consider this point A. Place no letters on the drawing. They would mar the piece when finished.

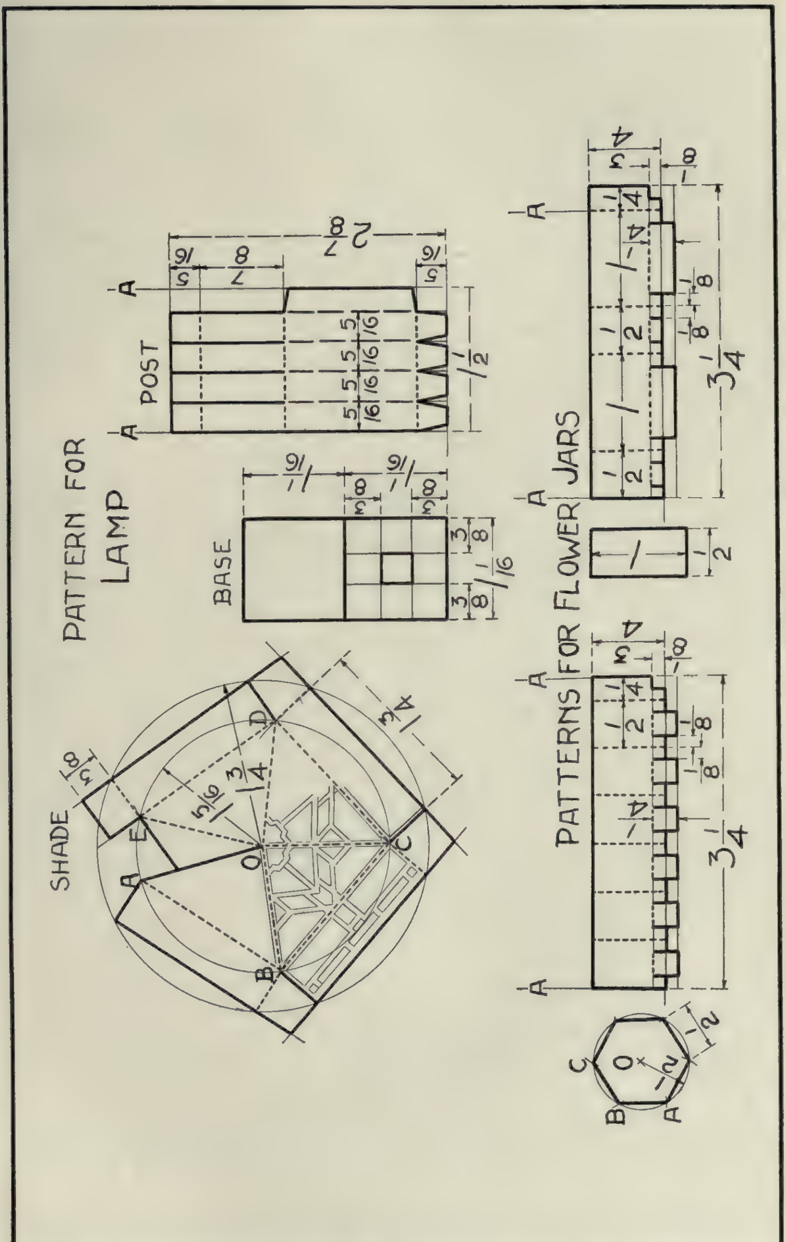


FIG. 26.

Top Sections:—Set the compasses at a radius of 1¾″.

Place the needle point at A.

Swing the pencil point to mark a short stroke across the circumference as at B.

From B mark off C in the same way and repeat from C and D.

Draw lines from A to O, B to O, etc.

Draw lines from A to B, B to C, etc.

Rim Sections:—Draw the larger circle. At A. and B. draw lines at right angles with line AB, out to the outer circle. Use the triangle.

Draw similar lines at right angles with *BC,* with *CD,* and with *DE.*

Draw outside lines extending them to cross. See Fig. 26.

Add both pasting laps at E.

Final details:—Mark cutting and scoring lines as shown.

Score, but do not cut until the color has been applied.

DESIGN.

Make several tracings of a top section with attached rim piece. With the pencil draw line designs on these, remembering that the angles and edges of the shade are structurally the foundation lines of the design, and should be placed first. All other lines must form connections with these but may be finer in accordance with the requirements and appearance of leaded glass. See Fig. 26A. When a satisfactory design has been made apply it to the lamp pattern in firm lines.

Lay a wash of water over entire paper. While wet, float spots of varying color over the surface to produce an effect of stained glass. When dry, color over the pencil lines with paint.

Cut and fold as indicated.

POST AND BASE.

Use paper the same as for furniture.

Follow drawing, Fig. 26.

Order of Pasting:—Note appearance of shade, Fig. 26A. Paste as shown.

Paste the side lap of the post pattern under the opposite vertical section to form a square column. Push a pencil thru the post to press against while pasting.

If the post is to be stained, stain post, base pieces and an extra oblong of paper 3″ x 2″, now.

The long flanges at the top of the post spread to form the supporting arms of the shade. The laps at the top should turn outward and downward. Mark with a pencil where they will fasten to the middle of each side of the shade, just inside the rim. Paste them in place one at a time.

Slip the short flanges at the bottom of the post thru the opening in one base square. Spread back the flanges and paste flat against the square. Roll the 3″ x 2″ oblong into a slender 3″ tube, stained side out. Push it thru the column until it supports the top of the shade at the right height.

Cut off any excess length of tube below. Paste the closed base square at the bottom of the first.

FLOWER JARS.

See Fig. 26 and Fig. 26A.

HEXAGONAL BASE.

To construct a hexagon:—Draw a circle with a radius equal to one side of the desired hexagon.

Mark a point anywhere on the circumference as at A.

With the compasses set at the same radius place the needle point at A. Swing the pencil point to mark a short stroke across the circumference, as at B. From B mark off in the same manner and continue spacing around the circle in this way. If work is accurately done the last stroke will fall on A.

Connect points by straight lines. Cut.

OBLONG BASE AND FRAMES.

Follow drawing Fig. 26.

Pasting:—Paste side lap of frame inside of opposite vertical section. The square laps should turn inward.

Push the piece for the base into the frame from the bottom, to test whether it fits. Remove, and if necessary trim the edges of the base.

Spread glue on the under side of the laps. Paste base in place.

(*To be continued.*)

A SCHEME FOR GRADING IN MANUAL TRAINING.

Henry F. Markus.

IT will be generally conceded that there are three important factors to be considered in determining a pupil's grade in manual training: the quality of the work done, the quantity of work done, and the practical knowledge and understanding of principles gained. It is believed that a single grade which takes due account of all of the above mentioned factors may be obtained by the following scheme.

Let us assume, for convenience, that a course in manual training consists of 200 periods of actual work. Then in order for a pupil to make a perfect grade each period should net him 100 ÷ 200, or ½ point.

If the date of beginning and of completing a given exercise is recorded for each pupil, the average time taken by the entire class to complete the exercise in question can be determined as soon as each pupil has completed the exercise. It may be well to exclude the time of exceptionally fast and exceptionally slow pupils in determining this average. Assuming that this average time is 10 periods, evidently the exercise should have a value of (½), (10), or 5 points, if done perfectly.

Each pupil will have received a grade on the completed exercise, and it is obvious that the number of points which should be credited to any pupil will be his grade on the exercise, in per cent., times the value of the exercise. If a pupil's grade is 70, the points credited to him for the completion of the exercise would be (.70) (5), or 3.5 points.

Quality and quantity have now received due consideration. A figure which represents a pupil's "knowledge and understanding" may be obtained by taking an average of results of written tests given on the work in manual training, such as "Action and Care of Tools," "Principles of Mechanical Drawing," "Sources of Materials," and the like. The weight which such tests should have with respect to the work in the shop and the drawing-room depends upon the judgment of the instructor. A satisfactory plan is to add 2/3 of the total number of points made on shop problems to 1/3 of the average grade obtained on written tests to make up a final grade.

The use of this scheme of grading makes a monthly grade in manual training possible, which sometimes proves a great stimulus to the work.

Again, suppose a month has 20 periods of manual training. A pupil doing perfect work; in average time will then have (20) (½), or 10 points to his credit. Any pupil having fewer points, say 7, has only 7/10 or 70 per cent. of the number of points constituting a perfect grade. This figure can be combined with the test grades to give a fair monthly standing.

There may be some objection to giving monthly grades in this way since the instructor must estimate the value of uncompleted pieces in order to determine the total number of points a pupil makes in any one month. However, if the instructor watches the work closely the average of all the monthly grades will not differ materially from the final grade.

A card of the form shown will be found very convenient for keeping records of the work accomplished by each pupil.

EXERCISES	Value	Date Begun	Date Finished	Time	Grade	Points	

FORM OF CARD FOR KEEPING RECORD OF STANDING OF PUPILS IN MANUAL TRAINING.

BOOKBINDING IN THE SCHOOL. IV.[1]

OSCAR LINCOLN MCMURRY.

MAKING BOOKS.

IN making books, the limitations may be many, as in dictating all the conditions, for example, in a sketchbook to be used by all members of a class for a common purpose. This might involve size, proportions, kind, and quality of materials and constructive details. The entire undertaking might be a series of exercises thru which to emphasize certain points in design or construction. The limitations may be few, as in the making of a notebook, in which every member of the class is required to take the initiative in determining the particular use to which the book is to be put and then working out the design to meet the need.

Books which children make are for the most part blank books but blank books to the child's mind mean much more than note or composition books. They mean books for clippings or postcards, books for silhouettes and sketches.

REBINDING BOOKS.

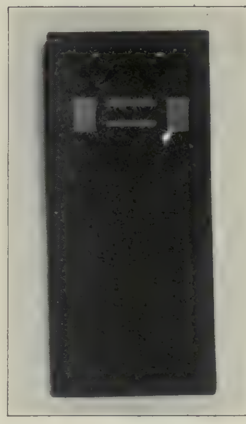
Much good material for rebinding is contained in reference and supplementary reading, in the Government reports on agriculture, gardening, or forestry; in the Congdon pamphlets comprising short stories suited to children in all the grades. These reports and pamphlets usually of one section are of fairly good paper, the text is legible, and the illustrations good.

Other publications, such as the Thomas Mosher books and the Masterpieces in Color are high class, both as to subject matter, paper, text and illustrations. Magazines like St. Nicholas form excellent material for binding.

Rebinding books means taking the work where another has left off and carrying it forward to a second finish. Rebinding carries with it

the idea of limitations; for example, in the matter of size and proportions of book, quality of paper used, character of text, illustrations, margins, etc. Rebinding books culminates naturally in library book work. We would above all things have children ready and able to put into good bindings good reading matter, whether in the form of reports, pamphlets, or books, whether fresh and new or soiled and worn.

Making and rebinding books, both blank and printed, was provided for in Group I, as outlined in a previous article in the MANUAL TRAINING MAGAZINE; see April, 1911, number. This group included one and several section (made from folded sheets) books in case bindings—books in built up covers. But we find that the experience gained in making and rebinding books of one or more sections is not all sufficient for the needs of children in school. A series of books not included in the first group is made up of unfolded sheets to form calendar, sketch and word books. These constitute:



A. 1. WORD BOOK.

GROUP II. LOOSE-LEAF BOOKS.

Books of this series may have paper, flexible or board covers, the leaves and covers being held together in one of several ways. The idea holds thruout the series that the leaves may be removed at will. Or, stated in another way, the covers may be used again and again. The sheets forming the leaves of the books vary but little except in size, proportion, and quality of materials. The covers, however, by reason of structural differences, suggest a number of subject groupings, which may be outlined as follows:

A. 3. LANGUAGE BOOK.

A. *Books with paper covers* punched for lacings or rings for word lists, calendars, and language work. The covers may be in one piece

folded around the leaves; in two sheets of same size, or of different sizes, one folding over the other. A cloth reinforcement of the hinge is sometimes used.

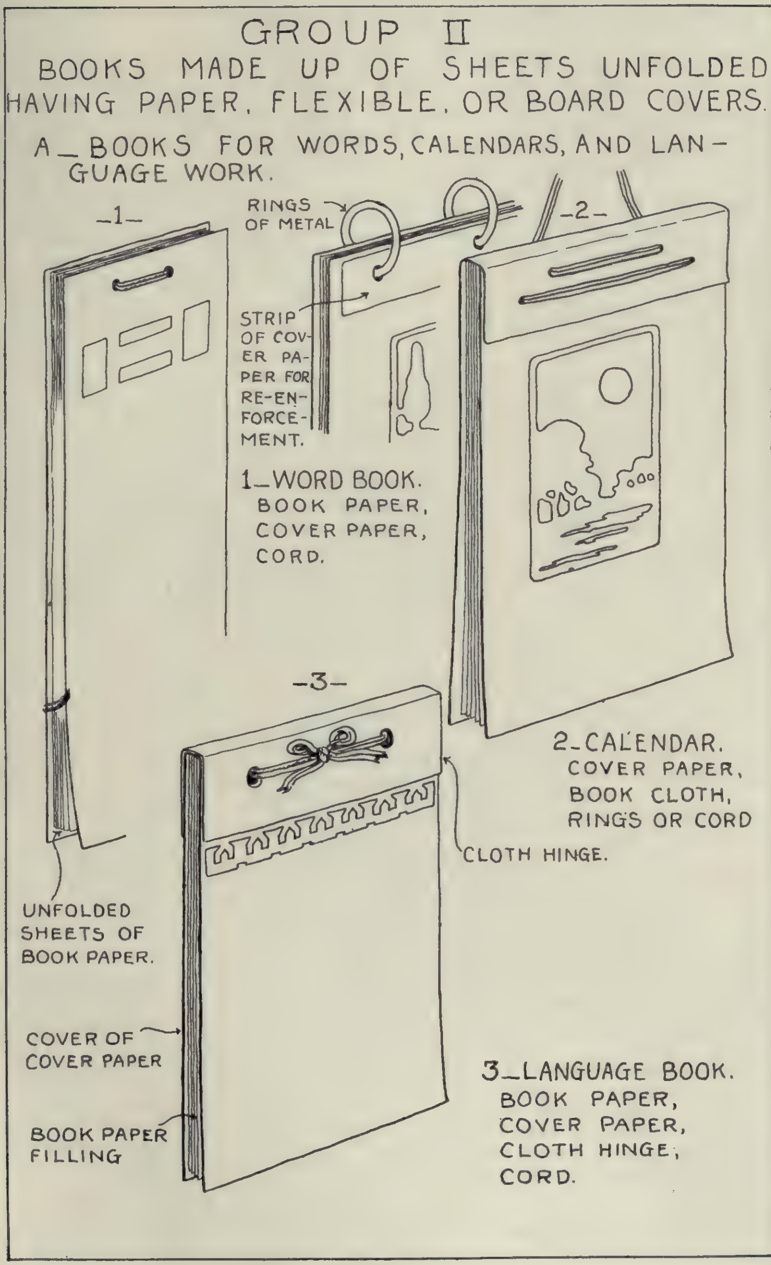
The lacing may show great variety in the number and placing of stitches and in the texture and color of the cord used, whether silk floss or mercerized cotton thread. Threads of different colors twisted into cords and varied knottings give interesting decorative effects. Likewise paper cuttings, tearings, crayon and water color decorations give an added interest. The rings may be made from wire. Rings that open and close by hinging may be had in different sizes.

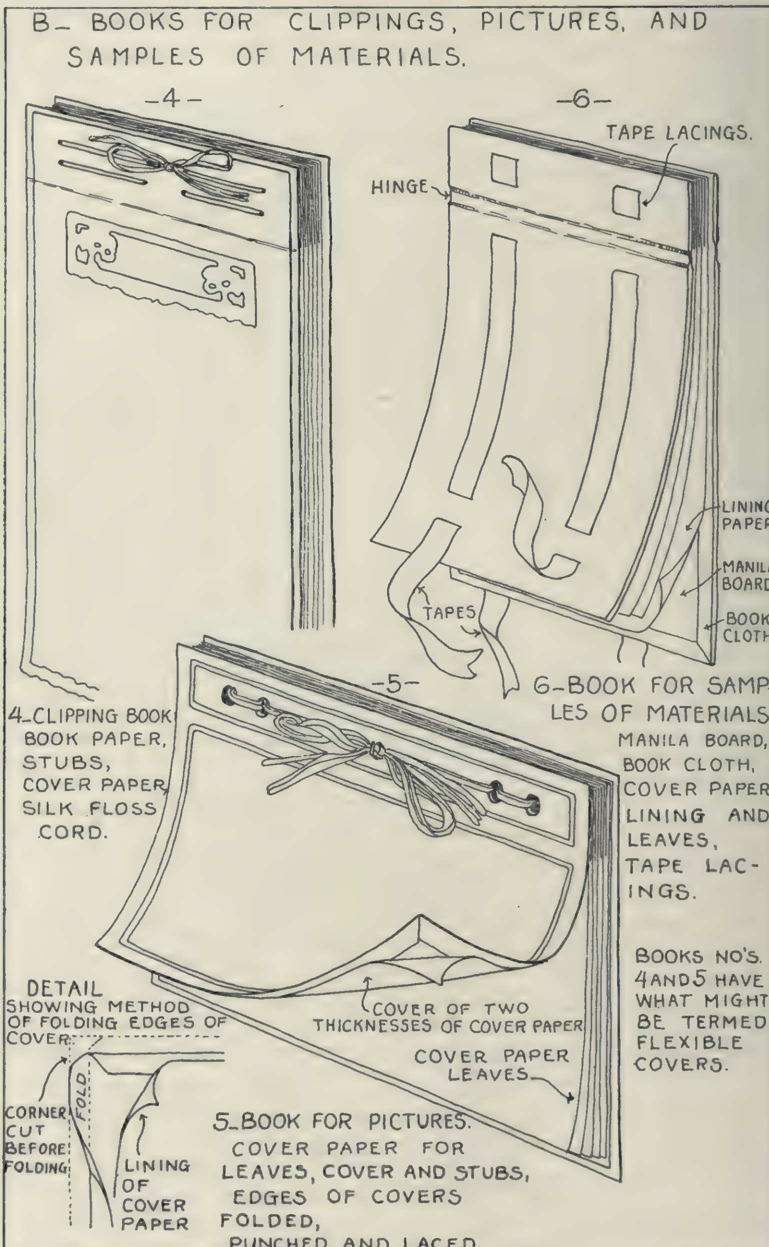
A. 2. CALENDAR.

Books in this sub-group may be made almost entirely by hand. The paper for book, whether for pencil or pen (such as Dresden pamphlet or Voucher bond) may be folded, creased, and separated to form the sheets of book. Paper for the covers (such as Rembrandt, Cadmus, or Parchment cover) may be prepared in the same way. The punching for the laces or rings may be done by large darning needles by children in the lower grades. In this way all details of construction can be carried out by every child.

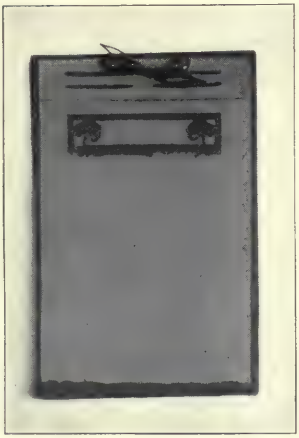
Plans for the decoration of the book involve a study not only of the color and texture of the writing and cover papers preliminary to the making but also of a suitable color scheme in the paper cuttings and tearings, crayon or water colors.

B. *Books with flexible covers* slit for tapes or punched for laces, for clippings, pictures, and samples of materials. The important details developed in this sub-group have to do with flexible covers. The simplest form consists of two thicknesses of cover paper (4) which may be in two colors with edges torn or with edges of one (5) folded and

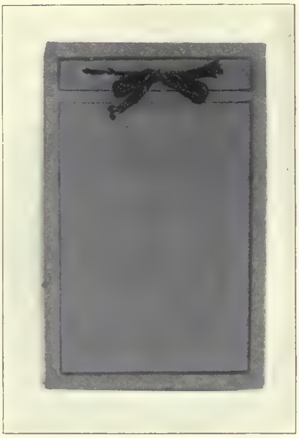

GROUP II
BOOKS MADE UP OF SHEETS UNFOLDED HAVING PAPER, FLEXIBLE, OR BOARD COVERS.
A_BOOKS FOR WORDS, CALENDARS, AND LANGUAGE WORK.
-1-
RINGS OF METAL
-2-
STRIP OF COVER PAPER FOR RE-ENFORCEMENT.
1_WORD BOOK.
BOOK PAPER,
COVER PAPER,
CORD.
-3-
2_CALENDAR.
COVER PAPER,
BOOK CLOTH,
RINGS OR CORD
CLOTH HINGE.
UNFOLDED SHEETS OF BOOK PAPER.
COVER OF COVER PAPER
BOOK PAPER FILLING
3_LANGUAGE BOOK.
BOOK PAPER,
COVER PAPER,
CLOTH HINGE,
CORD.


B— BOOKS FOR CLIPPINGS, PICTURES, AND SAMPLES OF MATERIALS.
-4-
-6-
TAPE LACINGS.
HINGE
LINING PAPER
MANILA BOARD
BOOK CLOTH
TAPES
-5-
4—CLIPPING BOOK. BOOK PAPER, STUBS, COVER PAPER, SILK FLOSS CORD.
6—BOOK FOR SAMPLES OF MATERIALS. MANILA BOARD, BOOK CLOTH, COVER PAPER LINING AND LEAVES, TAPE LACINGS.
BOOKS NO'S. 4 AND 5 HAVE WHAT MIGHT BE TERMED FLEXIBLE COVERS.
DETAIL SHOWING METHOD OF FOLDING EDGES OF COVER.
CORNER CUT BEFORE FOLDING
FOLD
LINING OF COVER PAPER
COVER OF TWO THICKNESSES OF COVER PAPER
COVER PAPER LEAVES
5—BOOK FOR PICTURES. COVER PAPER FOR LEAVES, COVER AND STUBS, EDGES OF COVERS FOLDED, PUNCHED AND LACED.

the other forming a lining. The book with the tape lacings illustrates the flexible cover (6) in its highest form, with manila board, cloth cover, and cover paper lining.



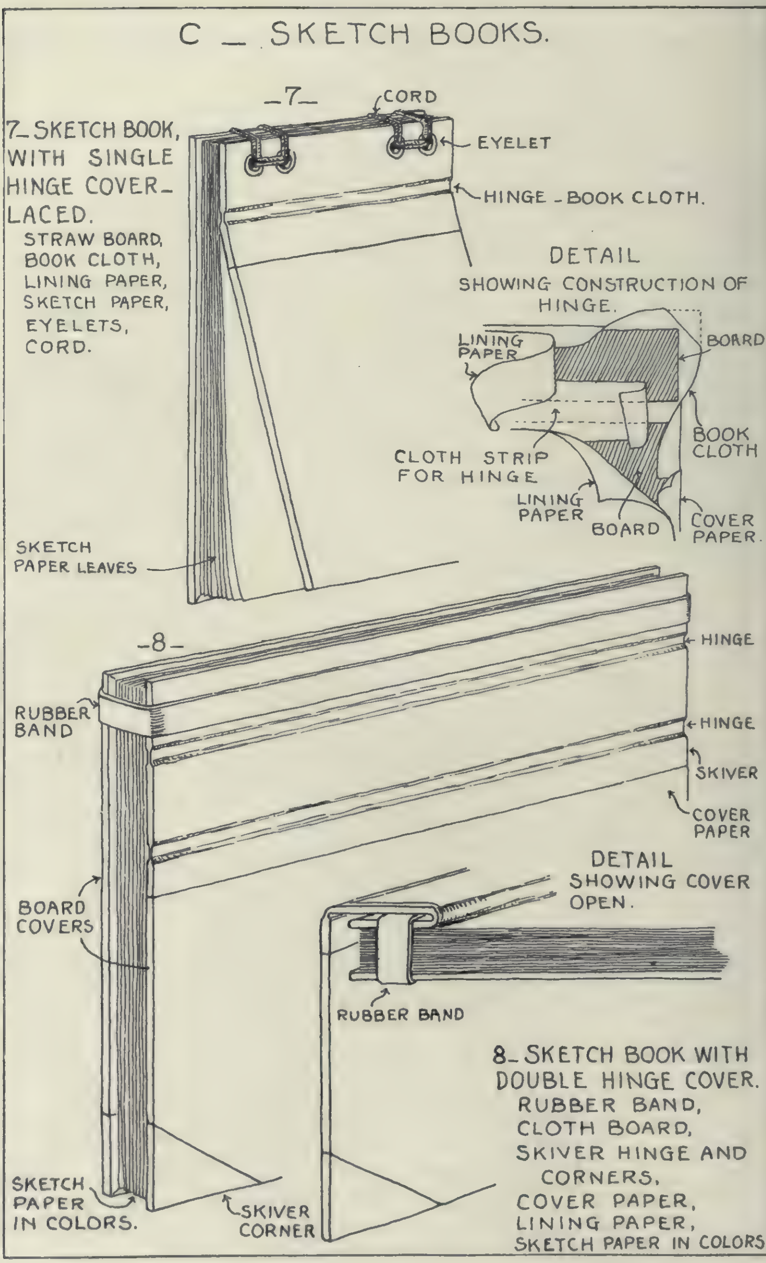
B. 4. CLIPPING BOOK.



B. 5. BOOK FOR PICTURES.

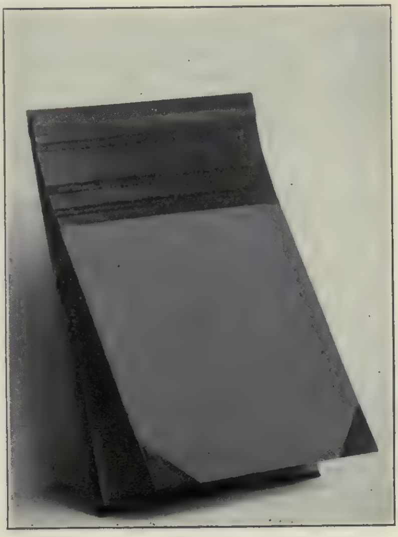
B. 6. BOOK FOR SAMPLES OF MATERIALS.

In order for these books to hold pictures or clippings, stubs (short leaves) are provided of the same material as the full leaves and laced in with the leaves.


C _ SKETCH BOOKS.
-7-
CORD
7-SKETCH BOOK, WITH SINGLE HINGE COVER-LACED.
STRAW BOARD, BOOK CLOTH, LINING PAPER, SKETCH PAPER, EYELETS, CORD.
EYELET
HINGE - BOOK CLOTH.
DETAIL
SHOWING CONSTRUCTION OF HINGE.
LINING PAPER
BOARD
BOOK CLOTH
CLOTH STRIP FOR HINGE
LINING PAPER
BOARD
COVER PAPER.
SKETCH PAPER LEAVES
-8-
HINGE
RUBBER BAND
HINGE
SKIVER
COVER PAPER
DETAIL
SHOWING COVER OPEN.
BOARD COVERS
RUBBER BAND
8-SKETCH BOOK WITH DOUBLE HINGE COVER.
RUBBER BAND, CLOTH BOARD, SKIVER HINGE AND CORNERS, COVER PAPER, LINING PAPER, SKETCH PAPER IN COLORS
SKETCH PAPER IN COLORS.
SKIVER CORNER

C. *Sketchbooks* with single or double hinged covers. The lower cover is in one piece to serve as a base for indoor or outdoor sketching. The upper cover, hinged singly or doubly, may be laid over and out of the way during the time of the sketching. The sheets forming the body of the book should be good sketch (such as Prang's) paper in a variety of colors for different background effects. The sheets may be held in place (a) by punching and lacing (7) with cords such as

C. 7. SKETCH BOOK WITH SINGLE HINGE COVER.

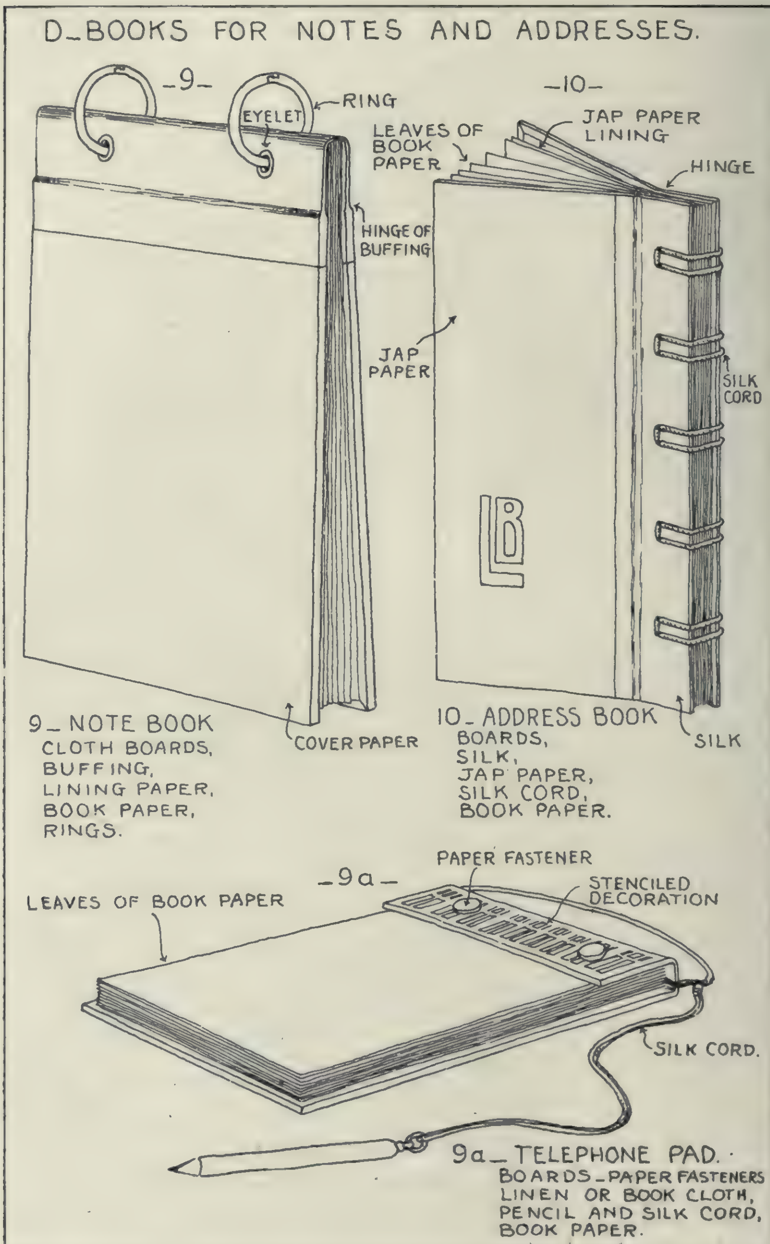


C. 8. SKETCH BOOK WITH DOUBLE HINGE COVER.

macrame or those made from silk floss: (b) by the use of rubber (8) bands, eyeletted by an eyelet (The Triumph) punch. Eyelets are made in different diameters and lengths and in a variety of finishes as silver, brass, tan, and black. Rubber bands in gray and red may be had in different lengths and widths.

Cloth board (No. 25 or 30) should be used in covers with book cloth, linen, or leather (skiver or buffing) for the hinges, together with cover paper for covering and lining the boards.

On the art side attention should center on the getting of good proportions and color schemes. On the construction side, good hinge work, punching, and eyeletting.


D_BOOKS FOR NOTES AND ADDRESSES.
-9-
RING
EYELET
HINGE OF BUFFING
COVER PAPER
9_NOTE BOOK
CLOTH BOARDS,
BUFFING,
LINING PAPER,
BOOK PAPER,
RINGS.
-10-
JAP PAPER LINING
LEAVES OF BOOK PAPER
HINGE
JAP PAPER
SILK CORD
SILK
10_ADDRESS BOOK
BOARDS,
SILK,
JAP PAPER,
SILK CORD,
BOOK PAPER.
-9a-
PAPER FASTENER
STENCILED DECORATION
LEAVES OF BOOK PAPER
SILK CORD.
9a_TELEPHONE PAD.
BOARDS_PAPER FASTENERS
LINEN OR BOOK CLOTH,
PENCIL AND SILK CORD,
BOOK PAPER.

D. *Books with covers secured by paper fasteners,* rings, or lacings for note and addresses. In this sub-group the covers are usually connected by cloth or leather to form the back. The covers and sheets making up the book are punched or drilled for paper fasteners and rings.

On the art side, the book for addresses may readily be an example

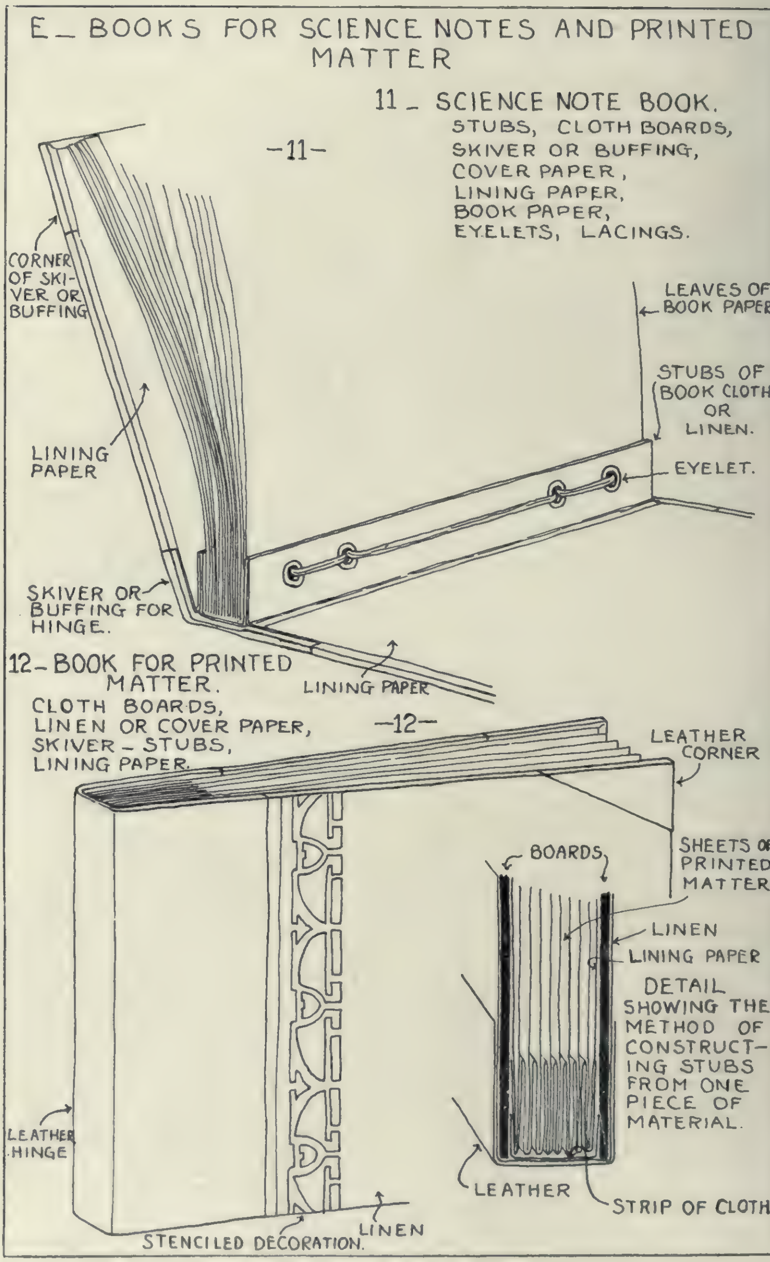
D. 9a. TELEPHONE PAD.

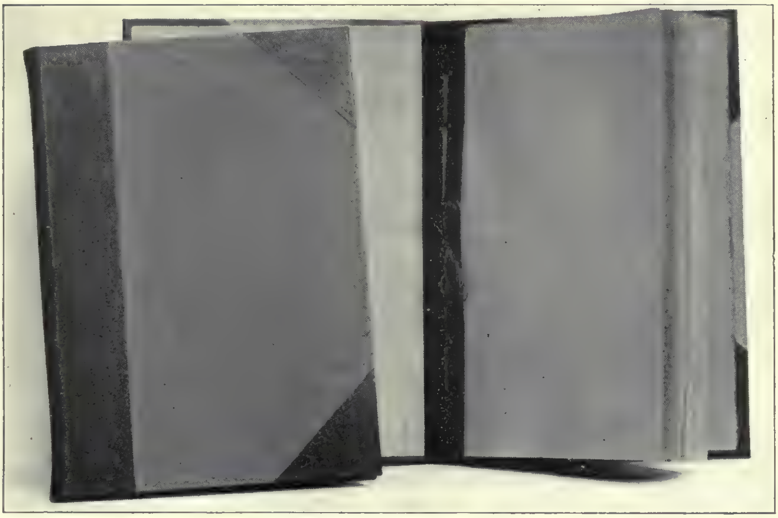
D. 9. NOTE BOOK.

of fine thinking in the matter of proportions and color combinations. This may be realized thru the use of silk cloth for hinges, Japanese paper for board linings and sheets of book, and bands of silk cord for binding board and sheets together. A stencil decoration may add to the interest in the cover.

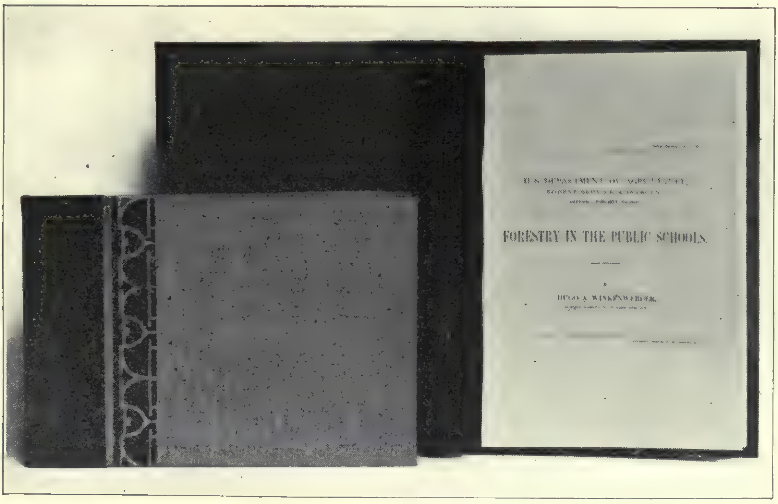
In planning books of this character it is well worth the effort to estimate the cost of the book in terms of the most effective materials to be had, and comparing it with the cost when common book materials are used. In a word, then, it is a question of the cost of the book in silk and Japanese paper and silk cord as against that of a book made from common book paper, linen or book cloth, and macrame cord. Another point to be borne in mind is that in book work high grade workmanship should go with high grade materials.

E. *Books with board covers and eyeletted cloth stubs* to secure the sheets (by punching and lacing) for science notes. On the construction side these books carry the most important details of the series, as shown in the board covers with leather back and corners, linen or cover paper


E_ BOOKS FOR SCIENCE NOTES AND PRINTED MATTER
11_ SCIENCE NOTE BOOK.
STUBS, CLOTH BOARDS,
SKIVER OR BUFFING,
COVER PAPER,
LINING PAPER,
BOOK PAPER,
EYELETS, LACINGS.
-11-
CORNER OF SKIVER OR BUFFING
LEAVES OF BOOK PAPER
STUBS OF BOOK CLOTH OR LINEN.
LINING PAPER
EYELET.
SKIVER OR BUFFING FOR HINGE.
LINING PAPER
12- BOOK FOR PRINTED MATTER.
CLOTH BOARDS,
LINEN OR COVER PAPER,
SKIVER - STUBS,
LINING PAPER.
-12-
LEATHER CORNER
BOARDS
SHEETS OF PRINTED MATTER
LINEN
LINING PAPER
DETAIL SHOWING THE METHOD OF CONSTRUCTING STUBS FROM ONE PIECE OF MATERIAL.
LEATHER HINGE
LEATHER
STRIP OF CLOTH
STENCILED DECORATION.
LINEN



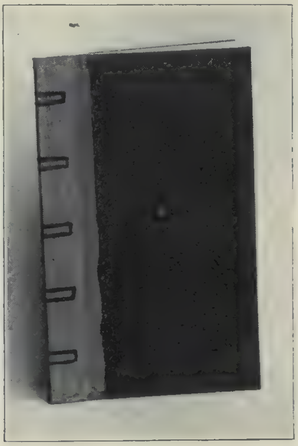
E. 11. SCIENCE NOTE BOOK.



E. 12. BOOK FOR PRINTED MATTER.

sides, linen covered stubs punched and eyeletted for lacing. Science notes may require a good quality of writing paper as well as suitable sketch paper. While we think of this book (11) as especially adapted to science note work, we may find that the cover serves well for holding pamphlets and other printed matter.

In outlining the two groups of problems in bookwork, the one involving the development of the section book, and the other, the loose-leaf book, children should be encouraged to work out their ideas under the direction of the one or the other, as the needs may seem to indicate.



D. 10. ADDRESS BOOK.

EDITORIAL

PRESENT tendencies in education and in industry are bringing the manual arts into the very forefront of discussion, and legislative action is making our possible field of effort almost limitless. Whether approached from the viewpoint of culture or vocational training, art and handicraft are now in the center of vision. The breaking away from old ideals and the acceptance of the new is manifest on every hand. Even in the strongholds of classical learning men are crying out against mere drill and discipline, and are demanding the real, the concrete, the practical knowledge that connects up with real life, and the beauty that can be interpreted in terms of the common things of every-day experience.

An illustration of this is found in an essay by Arthur Christopher Benson. When speaking of an English school this famous essayist says:

> One sees arrive here every year a lot of brisk, healthy boys, with fair intelligence, and quite disposed to work; and at the other end, one sees depart a corresponding set of young gentlemen who know nothing, and can do nothing, and are profoundly cynical about all intellectual things. And this is the result of the meal of chaff we serve out to them week after week; we collect it, we chop it up, we tie it up in packets; we spend hours administering it in teaspoons, and this is the end. I am myself the victim of this kind of education; I began Latin at seven and Greek at nine, and, when I left Cambridge, I did not know either of them well. I could not sit in an armchair and read either a Greek or a Latin book, and I had no desire to do it. I knew a very little French, a very little mathematics, a very little science; I knew no history, no German, no Italian. I knew nothing of art or music; my ideas of geography were childish. And yet I am decidedly literary in my tastes, and had read a lot of English for myself. It is nothing short of infamous that any one should, after an elaborate education, have been so grossly uneducated. My only accomplishment was the writing of rather pretty Latin verse.[1]

A New Ideal of Culture

And this is the view of one of the leading literary men of England who has spent most of his life as pupil and teacher in two centers of classical learning. The older ideal of culture is breaking or broken; the so-called humanities have, in large measure, failed to reach humanity. A new ideal of culture is forming, and new humanities are coming into the schools. In this

[1] The Upton Letters, page 160.

connection we recall a definition of culture once given by Dean Butler of the University of Chicago: "Culture is a sympathetic appreciation of the finer things of life—literature, art, music, courtesy and religion." In this definition we are confident Dean Butler would give to art the inclusive meaning that covers all true and beautiful handicraft. It is significant as well as gratifying that our modern thought concerning culture and our deeper thoughts concerning art over-lap. As we come more and more to see with William Morris that art, in its essence, is "the expression of man's joy in his labor" we realize that training in such expression may be one of the most subtle of the humanities and not merely a materialistic study. It becomes an efficient means of education on the side of feeling, and we can hardly fail to agree that fundamental, nation-building and joy-producing education must take into account feeling as well as intellect.

The Nature of Art

I look at a chair—a cheap kitchen chair, one of many thousands made each year in a great factory. I can sit on it; it will hold me up; it is a chair. I look at another chair and involuntarily I say, it is a beauty! It is a work of art! I can sit on it; it will hold me up; its construction and the proportioning of its parts suggest strength; its contours, its color, its finish and its skilfully subdued decoration give me joy. It is a chair, plus something we call art. It is this "something" that gives me the joy.

But what is this "plus" element—this "something" that gives joy? Is it merely material, or is it the spirit of the maker hovering about it? Whence comes it? Morris seems to have given us the secret. It is the expression of joy of the maker. It is akin to the joy we all feel in putting gratuitous effort into the making of a thing because we love to—because it helps us to give fuller expression to our ideal—because it gives us the joy of creating and of realizing our nobler aspirations.

An incident once told by President Frost of Berea College helps to make clear how this joy may be a common human experience.

A little girl in a sewing class in a Southern school completed the apron that had been assigned as a problem by the teacher, but she was not satisfied. She came timidly up to the teacher and said, "Please, teacher, may I put a pocket in my apron?" "Why, yes, Jennie, if you want to, you may put a pocket in your apron," said the teacher. With joy the little girl went back to her seat and most carefully sewed a pocket on her apron. It made the apron more useful and convenient, but still

she was not satisfied. Again she came slowly and hesitatingly up to her teacher when no one was near, and with feeling in her voice, she said beseechingly, "Please, teacher, may I put a ruffle on the bottom?" An apron, plus—plus joy expressed in realizing an ideal!

And this girl was not a genius. Her aspiration is our common inheritance. The germ of art has been planted in every human breast. The new humanities will include its development. Again we recall Dean Butler's definition, "Culture is a sympathetic appreciation of the finer things of life—literature, art, music, courtesy and religion."

Function of Vocational Training We have referred to the manual arts as being in the center of vision at the present time. We have spoken of the new definition of culture that is affecting education and giving a larger place to art. We may speak with even greater emphasis of another new element which we call vocational education. This is just as much dependent upon work in the manual arts as is cultural education.

General or cultural education lays foundations that are essential; it also gives breadth and flexibility of thought and action; it spreads before the pupil the whole drama of the past and inspires him with life for the future,—it gives him ideals. But alone it does not produce the carpenters, the plumbers, the masons, the architects, the decorators that build our houses. Alone it does not produce the agriculturist, and the miller and the baker and the merchant that provide us with food. Alone it does not train men to grow cotton or flax, or to spin fiber and weave cloth, or to cut and fit the garments we wear. Alone it fails to produce the men who design and construct and operate the great engines of commerce on land and on sea, and the expert men who work in the industries that preserve for us in book and periodical the wisdom of the ages. General education alone cannot, from its very nature, produce the specialist except the specialist in generalities, and it is the specialist in specialties that causes the world to progress in the twentieth century.

Two Roads to Culture John Stuart Mill once said: "Education makes a man a more intelligent shoemaker, if that be his occupation, but not by teaching him how to make shoes; it does so by the mental exercise it gives and the habits it impresses." This statement may have satisfied the ideals of the middle of the nineteth century but it will not satisfy the ideals that are to be in the middle of

the twentieth. The future as well as the past will declare with Mill that "Education makes a man a more intelligent shoemaker," but from this point on the statement will change. It will read: He will become a more intelligent shoemaker by being taught how to make the best shoes, and the relation of shoes and shoe-making to society. It may be that for the shoemaker shoemaking will be the focal center around which geography, arithmetic, science, and art, will gather, and from which a wider and wider expanding field of knowledge will radiate until it covers a large field of general intelligence in addition to shoemaking. Thus we discover a new approach to culture; namely, thru the occupation. And Dr. Kerschensteiner of Munich says that he believes this method of approach to be better than the usual one of general education. It is surely better for many if it reaches the desired goal, for in the process it gives the pupil power to become an efficient citizen.

—CHARLES A. BENNETT.

Educational Economics In a certain community, not more than three hundred miles from Chicago, the spring election for members of the Board of Education turned upon a fight over the question as to the propriety of offering in the public schools courses in manual training, domestic science, agriculture, and the commercial branches. In part, the argument of those who opposed the progressive program of the Board was as follows: It costs a good deal of money to provide these forms of training; the College of Agriculture maintained by the state is only a short distance away, in two near-by towns are flourishing Business Schools, and in Chicago are to be found technical schools of all kinds for those who want them; let those who want these special lines of work go to these schools where they are offered; it is sufficient for this community if the schools give our boys and girls "an education."

In another community the citizens voted this spring on the question of a township high school, under a school law which permits the organization of a district including territory outside the limits of the village or town. The increased taxable area yields revenue sufficient to provide excellent high schools, with full equipment and courses, in localities that otherwise can not support them. In this particular instance the proposition was voted down, and according to an Associated Press dispatch, "the principal cause which kept the majority from voting for it was the

cost of such a school, but the benefits to be derived from it were not given any thought."

Responsibility of the Manual Arts Supervisor Evidently there is still work for the educational missionary! Who is to help the Boards of Education convince the people of the unsoundness of the policy that permits one community to depend upon another for the elementary and secondary education of its children? Must we not protest against the injustice of providing the best possible training for children who expect to go on to college while ignoring entirely the needs of the ten times larger number of boys and girls who must complete their training, so far as the schools are concerned, in the high school or earlier? The fact that instruction in shopwork and domestic science is expensive as compared with instruction in arithmetic must not be permitted to obscure the facts as to the relative "educational" values of the three subjects. Manual Arts teachers and supervisors must take hold of these problems and make themselves felt. They must be something more than teachers and supervisors, they must be earnest students of education. They must be able to take a broad view of their work and its relation to education, and they must qualify themselves to make substantial contribution to the solution of the perplexing problems now before the people. —WILLIAM T. BAWDEN.

Vacation Period Begins It is the time of the year when the eyes of the school are turned upon the calendar marking the last day before the long summer vacation. Soon the educative process as expressed in school activities will stop as suddenly as does a planer bed when it changes its direction of motion.

The "schooling" of the child has been limited to five hours a day for five days of the week for one hundred and sixty days of the year. Meanwhile his larger "education" has been constantly going on and when the vacation period begins these larger and oftentimes more effective educational agencies have their free play. Unfortunately these agencies do not always work for good. If his school has been more than a recitation period, then the pupil is going to miss it. If his teacher has seen something beyond percentage marks, then the pupil is going to miss him. If his home is nothing more than a pantry and a bed or a place to go when everything else is shut up, then the boy is bound to miss the school.

While in school the boy has had some chance to have his desire for activity turned from deviltry into useful knowledge, productive labor, and wholesome play. It is not too much to hope that his capacity, interests and native ability have been studied and wisely directed by his teachers. It is rather expected that every hour out of the twenty-four was a step forward in his educative progress and that the task of educating him was something more than a mere school affair.

Is a Vacation Necessary? But now the school doors are shut upon him. He is left to run the race with his feet untied from the school band and probably he is glad. But in the days of to-morrow, it is to be hoped that the educative process will not have its work interrupted by an excess of holidays and vacations. In fact, the educative process should be so wisely distributed between work done in the home and in the school, between the book work and the activity work that every day will be both a holiday and a work day, the school simply adapting its occupations to the requirements of the season. In the city of the future every large city school will have open play grounds or roof gardens, there will be large recreation centers and the parks will have some free space where "Keep off the Grass" remains unposted.

Of course, at present both the teacher and the boy need a rest. One can easily realize how tiresome it is for teachers to ask questions all day long when they already know the answers and how hard it is for boys to play the educational game when they can not help feeling that the cards are stacked.

The Teacher Needs A Change But there is another party besides the boy, to be considered in the education problem. It is the teacher. What is he to do with his vacation? Some are figuring out one good, long, grand loaf. Others are laying plans for one long grind at a summer school. Neither is desirable nor necessary. A change is advisable but it need not involve loafing nor intellectual perspiring. The vacation period should be consciously and consistently used for self-improvement. If a teacher is physically tired out, then the first thought must be for the nerves and worn out tissues. A trip to Europe is within the resources of many to-day if plans are carefully laid and advice is sought of those who have gone before. The ocean voyage is bracing. The change of scene is a care destroyer. Beside, one adds a touch of color to his personal background.

If the teacher needs a background of real industrial life to meet the demands of vocational education, let him buy a dinner pail and punch the time clock and take his place at the automatic. He will find that he will appreciate a good bed and a square meal and will have little need for sleeping powders. His experience will have a healthy reaction upon his school work and will contribute to his philosophy of life. Possibly the thought expressed in his Ph. D. thesis will be a trifle upset and if the ranks of syndicalism do not receive a convert, it will be fortunate.

If the teacher of shopwork lacks real shop training, then let him find a job for himself (not a position) in some shop where he can learn shop processes. He will discover that there is a difference between handling a two by three pattern in a ten by twelve flask and managing a traveling crane in the foundry. He will know that the file is not the blacksmith's true friend in his drop forging plant and that fancy titles have not much place in a commercial drafting office.

If a teacher has failed in the discipline and in the quality and quantity of the work which his boys are doing, he had better pack his grip for the nearest summer school. He has failed because the subject matter which he has attempted to teach is not well organized in his brain. He may himself know how to plane a board, make a box, but his boys do not get the results. His class demonstrations may be too long or too infrequent. He may give directions too hurriedly and assume that he is teaching adults instead of immature youth. Even in the manual training room the boys will not behave unless they are wisely directed. They will not be interested unless they succeed in accomplishing something. They can not accomplish unless they are wisely directed. They can not be wisely directed unless the teacher has a clear conception of processes and the relative values in his own mind, and enough knowledge of boy nature to reach the class as a whole.

What to Take at Summer School The teacher should take at a summer school, as a major subject, that which he things he needs and then as a minor subject that which his superior or his professor tells him he needs. Many times we need to be shown that we have a need. Men have been known to spend money and time at a summer school learning nothing more than how to make a Morris chair, and to neglect lectures on the spirit and purpose of the manual arts because, as they put it, "What do I want of any theoretical stuff?" On the other hand, there are teachers who grind away at lectures and round tables, studying all

about motor versus sensory areas, who would not know the difference between the two unless they were labeled. People of this sort like to stand around a shop room with a note-book, "observing."

The technique of the fundamental types of industrial arts is to be considered by those who need it. Then there is the study and practice of the educational method of these subjects in work of instruction in schools of various kinds and grades. Beyond industrial arts work there is a field of industrial mathematics, industrial geography, and industrial history. Preparation for positions as supervisors of industrial arts, or principals of vocational schools implies more than shopwork practice.

Forming the Background Beyond the technical side of self-improvement which results from summer school work, there should result a better filled in background. The development of the personal make up of the teacher is like the painting of a picture. It needs a good, firm background. Artists do not paint pictures on piles of saw-dust or on surfaces of lakes. They carefully prepare a canvas. It is the same with a teacher. He must have something on which to put the paint and over which to run the brushes. Furthermore, he must have the tools and materials with which to paint. These articles he will obtain at the summer school in the shape of tool processes, shop methods, shop economics, and principles of education. Oftentimes teachers place their whole emphasis on the gathering up of a lot of tool processes and materials but such teachers never become artists in the profession any more than the painter is necessarily an artist because he possesses a lot of brushes and paints. He could be nothing more than a house painter unless he has other points, such as—a good outlook upon his profession, a feeling for it and desire to paint something worth while and express power to that which comes from within. It is the same with the teacher. He needs this perspective and it is not gained merely from the study of tools or paints or brushes. It comes out of one's associations; out of the books that one reads; out of the life that one lives.

Very likely the best which results from attendance at a summer school is not named in the items of the annual catalog. It is not found in course I or topic fourteen. It is not to be taken down in shorthand from the lips of the lecturer. It is too subtle to name yet too evident to remain unrecognized. —ARTHUR D. DEAN.

ASSOCIATIONS

DEPARTMENT OF SUPERINTENDENCE.

The largest meeting in the history of the Department of Superintendence was held at St. Louis on February 26 to 29, 1912, with over two thousand delegates in attendance Among the topics of special interest to workers in the field of manual arts were those discussed in the Wednesday morning session, "Problems Relating to Child Welfare." Superintendent Carroll G. Pearse, Milwaukee, in describing the "City Trade School, an Important Instrumentality for Improving the Vocational Need of the City Child," outlined the conditions that have arisen in the industries making it practically impossible for the boy or girl to learn in the shop or factory all of the processes involved in the mastery of a trade. Two types of trade school were mentioned: (1) The school which offers the equivalent of all or a part of the apprenticeship and enables its graduates to begin as journeymen mechanics; (2) The school which receives apprentices or journeymen and offers training supplementary to that received in the trade. Mr. Pearse presented facts showing that trade instruction should properly be regarded as an investment rather than an expense.

A paper on "How Should the School System Contribute to an Intelligent Choice of Vocation on the Part of the Pupil?," was read by Assistant Superintendent George Platt Knox, St. Louis. The three factors to be considered are the child, the influences that make him what he is, and the callings which he may enter. The aim must be to help the child to appreciate real values and to choose for himself the best It must not be forgotten that for the school to require any child to enter any specific calling is a usurpation of function not to be tolerated. The following were given as the absolutely essential conditions: (1) Careful investigation of the child, the environment, and vocations; (2) A central office with investigators trained in child study and educational methods, and armed with the confidence of the public; (3) Intelligently planned questionnaires and investigations; (4) Careful examination and appraisal of existing contributions toward the solution of the problem, such as training offered by various schools, factories, transportation systems etc.

Specific vocational guidance must be something more than a mere interview and the offer of advice; it involves education of the young people. The teacher or the principal *who knows the child* must be the child's vocational counselor, and *he* must be advised by the expert *who knows the vocation.* Those teachers should be selected for this service who care the most for it and who are temperamentally best adapted to it.

Vocational guidance must be an individual affair with one child at a time, with the parent present, and the best place is the school building. Vocational counselors should be definitely trained for the work.

The question of the maintenance of an employment bureau is a debatable one, but whether this activity is carried on in the public school or by private parties outside, it must be at least under the close supervision and control of the school.

THE EDUCATION OF GIRLS.

From many points of view the best thought out and the best written paper of the entire four days' session was that on "The Education of Girls" by President L. D. Harvey of Stout Institute, Menomonie, Wisconsin. This paper was an admirable exposition of the argument for providing special training in home making and allied subjects for girls.

What the man needs to know in order to make a success of himself in the world has been the determining factor in the training of the boy. In the same way we must seriously study what it is that the woman needs to know in order to make the highest success of her womanhood in order to plan sanely the proper sort of training for the girl. A study of the subject from this point of view at once establishes the necessity for differentiation between the training required for boys and girls.

The well being and perpetuity of civilized society depends directly upon the intelligence and the efficiency of woman in the home. The education of girls must take this fundamental principle into account.

At the Wednesday afternoon meeting of superintendents of the larger cities, Associate Superintendent Andrew Edson, New York City, laid down the following proposition in discussing "Types of Special Schools in the Larger American Cities With Special Courses of Training for Special Groups of Children:" (1) We have not yet grasped the importance of the problem of providing for children who need special attention or special instruction; (2) Except for the truant, the incorrigible and the tuberculous this special work is best carried on in the regular school; (3) Ordinarily the beginning can best be made thru the department of health; (4) Insist on small classes and special teachers; (5) The school buildings should be kept open thruout the summer months and provision made for special lines of work, industrial activities, etc.; (6) For children who must leave school there must be provided special vocational courses; (7) If the Board of Education can not provide the funds necessary a beginning can almost always be made thru private initiative; (8) A careful study must be made of causes, conditions, and results.

At the annual business meeting held at the close of the Wednesday morning session, the following officers were elected: President, Superintendent F. B. Dyer, Cincinnati; First Vice-President, Superintendent Samuel Hamilton, Allegheny County, Pennsylvania; second Vice-President, Mrs. E. C. Ripley, Assistant Superintendent of Schools, Boston; Secretary, Professor B. W. Terryson, State Department of Education, Little Rock, Arkansas. Philadelphia was chosen for the 1913 meeting.

Of the other societies meeting at the same time was the National Society for the Scientific Study of Education. At the session held on Monday evening the eleventh year book of the society was taken up for discussion. The topics were as follows: (1) Industrial education, typical experiments described and interpreted; (2) Agricultural education in secondary schools. The discussion was participated in by Professor Charles H. Judd, University of Chicago; Dick J. Crosby, United States Department of Agriculture, Washington; Superintendent R. J. Condon,

Providence, Rhode Island; Secretary R. E. Hieronymus, Illinois Educational Commission, Springfield; and Assistant Dean W. T. Bawden, College of Engineering, Urbana. Dr. Judd emphasized the necessity for making plans for industrial education a vital part of the general scheme of education. Superintendent Condon outlined the plan of cooperative part time education organized by the public schools of Providence in conjunction with certain employing manufacturers. He indicated his belief that the cooperative plan should be worked out along other lines in addition to machine-shop practice, such as printing, banking, the building trades, etc.

In the Providence school a model home has been planned in which the girls who are receiving instruction in household arts may have opportunties for practical work in home making. This has been called the "home school," and includes kitchen, laundry, living-room, bed-rooms, bath-room, etc.

Secretary Hieronymus outlined six vocational courses which the Illinois Education Commission proposes to encourage every high school to offer: (1) A course leading to the writing and literary occupations; (2) A course leading to farming and agriculture; (3) A course leading to scientific professions, law, medicine, surgery, etc.; (4) A course preparing for the useful and artistic crafts, building trades, etc.; (5) A course preparing for the callings of the business and commercial world; (6) A course providing for the application of science and art to home keeping. —William T. Bawden.

BOSTON MANUAL TRAINING CLUB.

March Meeting.

For some years Boston has been doing pioneer work along the lines of pre-vocational education. The experiment in the Agassiz School was the first of several of like nature which have attracted national notice, and have been signally successful.

Last February the School Committee, recognizing the fact that these classes were no longer experiments, made them a regular part of the school system, and authorized the extension of the idea under the name of "Pre-Vocational Centers." They also created a new position,—that of "Pre-Vocational Instructor." Six pre-vocational centers were immediately authorized. Three of these, the Agassiz, for woodworking and box-making, the Quincy, for machine-shop practice, and the Oliver Wendell Holmes, for woodworking, were already in operation as "Industrial Classes." The other three are the Lewis, for printing, the Sherwin, for sheet metalworking, and the Ulysses S. Grant, for book-binding. These will be in operation before this issue of the Magazine reaches its readers.

These pre-vocational centers are located in the elementary school districts of the same names. It is proposed to admit, upon request of their parents, boys not less than twelve years of age who purpose entering industrial life at or soon after fourteen years of age, or who need special attention and increased constructive stimulus to enable them to graduate within the usual school period. It is hoped to prolong school life in certain cases and to prepare for admission to the Boston Industrial School boys who would otherwise go into unremunerative employment at 14.

Because of this recent step in Boston, the Program Committee of the Club arranged for a Pre-vocational Meeting, and invited several of those directly interested in pre-vocational instruction to tell of their experiences and plans. A rèsumè of the talks follows:

WOOD-WORKING AND BOOK MAKING.

This topic was discussed by Celia B. Hallstrom, pre-vocational instructor, Agassiz School, who said, in part: "In 1907 a class consisting of 56 sixth grade boys was started at the Agassiz School. This class was divided into two sections, alternate periods, averaging for each week four hours of shopwork and one hour of drawing. New sixth grade classes were formed the two following years, so that eventually there were three grades, of two sections each, at work.

"The work differed from manual training, as ordinarily conducted, as it was neither class work nor individual work, but was carried on as group work, divided according to the processes involved. When manual training was first introduced, the industrial element was frowned upon, the personal element was supreme, but now it has become generally recognized that the best incentive to work is not always the appeal to personal desire. As a boy becomes a link of the chain, he does as well for his group as if working for himself alone. The articles he helps to make, produced often in quantities, are sent out to the various departments of the school. In each case the worker understands that these things fill a definite need, and his pride in the finished product, stamped with the name of his school, holds him up to his highest standard of work. Each boy is also kept in check by his co-workers, as they soon come to realize that one defective part spoils the complete product.

"The work of the sixth grade is mainly with heavy cardboard, strawboard or newsboard. When several hundred pasteboard chalk boxes are needed, each boy at first makes a complete box, freehand, so to speak; first drawing out the development, then cutting from thin paper. If this is satisfactory he gets a piece of newsboard, develops his box, cuts, scores, bends, stays, pastes, etc., until his box is complete. He then has a good idea of the materials, tools and processes employed. Those who fail at first, continue to work on paper until a fair amount of accuracy is developed. Thus without wasting valuable material both teacher and boy find where the difficulty lies. When the class is ready to begin group work the instructor knows where to place the difficult and important processes. The poorer workers have to act as helpers, until they show improvement, and the very poorest merely carry stock, clean up, etc.

"Finally the work is apportioned; some cut newsboard on the card cutter, others test, others score, others bend and fold; some glue and paste, while others stay corners. Counting and packing is left to the helpers.

"Each boy has a job-card. Against the date is recorded work assigned, stock received, finished parts turned in, material spoiled, stock on hand. The wage column is used to mark workmanship. The time column is occasionally used to figure a shop average on various parts turned out in a given time. In subsequent lessons each boy must come up to the shop average or work after school. On large orders the shop average is gradually raised as the boys become accustomed

to the particular pieces on which they work. For example a certain box lining shop average was 5, that is, each boy must line five boxes before going home. At the close of the job it was 15.

"Jigs and gages are extensively used and the making of these is one of the most important parts of the work of the upper classes. These mechanical devices promote accuracy and rapidity but only the most skillful are allowed to do this very accurate work. For this class of work they may be made of wood. Some boys have shown considerable ingenuity in the invention of jigs. The operator using these short-cut methods must give careful attention or he will spoil great quantities of material; he must constantly examine his product to see that everything is properly done. Often thousands of pieces are cut and great responsibility rests on the boy using the machine or jig.

"The work of the seventh and eighth grades is carried on in a similar way, but with wood, making looms, shuttles, needles, spool-holders, bench-hooks, ink-bottle holders, etc., sometimes singly, more often in quantities.

"In all grades mechanical drawing parallels shopwork, first in sketching objects then in making complete working drawings. A little geometric work is given; perspective and isometric are used when applicable to the work in hand. Some time is given to the study of our native trees and their wood.

"Altho the visible results of this work go toward supplying our schools with material, the development of each boy to his greatest efficiency, is the guiding factor. The spirit among the boys is this: my part shall be so well made that we can proudly stamp each finished piece of work—'made in the Agassiz Pre-vocational Center.'"

MACHINE-SHOP PRACTICE AT THE QUINCY SCHOOL.

James C. Clarke, pre-vocational instructor, described the work as follows: "Those of you who saw our boys at work during the educational exhibit of the Chamber of Commerce last October, may realize the ties that are influenced by this education. The skilful Chinese boy, an Italian, having the use of only one arm, *making* a way where he can not find one, a Russian Jew proving himself capable of 'taking charge of the school shop,' two Syrian boys now giving satisfaction in a shop where last year they worked 'part time,' (one week in shop and next at school), all these find honest pleasure from the work of lathe and planer. This class has been an object of interest to the twenty or more nationalities that make up our school population, and is receiving strong support from the parents of the boys.

"As far as possible, a real shop atmosphere has been created. We have our shop, with its machinery and tools; the tool-room and its checks and keeper; the drafting-room where some of the problems are worked out, tracings made, and blueprints taken. The shop has its job foreman, its blacksmith, and its painter.

"The class was started with a limited equipment, consisting of vises, files, a few hammers and chisels, and one blacksmith's drill-press. Work is furnished us by the School Department and the Schoolhouse Commission; for the lathe, in turning and cutting threads; for the planer, in blocks, angles, plates, etc.; for the forge, in chisels, pins, and pokers for furnaces; for the upright drill, in braces,

later to be bent a quarter of an ellipse at the vise. Small tools are made when there is no other regular work. Thus, there is work of some kind for boys at all times. They are allowed to use the various power machines in the shop, of which there are ten, as they display earnestness and ability.

"The spirit of activity is felt even in their cultural work, and the gain is so rapid in the classroom that no time is lost toward graduation. Some of the shop features, if so they may be called, are these;—

"*First.* We attempt to develop a shop atmosphere in our work and such a degree of skill as might be expected from 13 to 14 year old boys; that the industrial world may seem natural to them as they enter it later.

"*Second.* The boys acquire a reading knowledge of drawings and blueprints, and a few get even more, including tracing and blueprinting.

"*Third.* Individual work makes it possible to place some boys on part-time work outside, spending one week in school and the next week at work. This arrangement meets the needs of two classes:—those whose homes need financial aid and those whose hearts are not in books. We do not expect these to graduate, yet feel that we are giving to the state better citizens than if the boys left in the fifth grade.

"*Fourth.* An Advisory Committee has been secured, which makes recommendations to and for the class. It also takes an interest in the future of the boys.

"*Fifth.* The boys are grouped in three grades, according to their ability. All are apprentices as they enter, later becoming journeymen as they gain skill in the use of tools, and mechanics as they prove worthy of guiding the work of others.

"*Sixth.* On Wednesdays some eight or ten 'journeymen' and 'mechanics' meet for lunch and conference. Often talks are given by some visitor, or the boys work out shop problems.

"Our aim has been to develop a spirit of self-reliance and one of obedience. These two factors we believe will make true workmen."

PRINTING.

The subject of printing was discussed by Morris H. Brown, Newton Independent Industrial School. "No other development of industrial school work gives promise of greater benefit to industry, the school, and the pupil than does printing. The first aim of the school instruction in printing is to arouse an interest within the student, and to this end some history of printing, type making, paper making, and machinery development should be given. To these studies are added the use of type and equipment in such a manner as to have practical illustration accompany rule and theory. The best textbooks and the best work are used with the view of impressing students that, instead of a one-man-idea, the instruction is based on theory and practice of the best writers concerned with the upbuilding of printing, as exemplified in the best modern commercial work. In addition to instruction in the history, principles, and development of printing, there is complete training in actual shop practice. The student not only learns how things are done, but does them. Fundamentals are thoroly taught; rules and

methods of composition are carefully explained. Point system, type measurements, proofreader's marks, printing office terms ,and general outline of newspaper styles from simple locals to advertising sections follow one another in logical order.

"The book composition course gives the student a line of work in the composition of good book pages, and cultivates attention to detail and appreciation of the better elements of composition. The course covers proofreading, composition of all forms of book pages, styles of poetry, foot and marginal notes and reference marks, advertising typography and general newspaper work, ad. setting, type faces and their uses, and making up forms.

"The job composition lessons include forms and uses of display borders and ornaments, take up the more exacting usages of type, concentrate on the general practice of typography, include society printing, cover and title pages, commercial stationery, business and professional cards, statements and bill heads, etc. The student is taught to lay out 'dummies,' and is given information in regard to estimating on job work. The theory of color and color harmonies is not ignored.

"A method of imposition has been developed whereby the theory of imposition is thoroly drilled into the minds of the students, and which requires them to lay out their forms, giving dimensions of furniture used in backs, gutters, and margins. There is much in imposition that can be learned only thru practice, as for instance locking up a form.

"The course in presswork includes adjusting and feeding, the care of rollers, preparing tympan, overlays and underlays, printing inks, register and margin, book work and mixed forms, wood-cut and halftone make ready.

"During our first year's work, just completed at the Newton Industrial School we have been able to do in a satisfactory manner practically all of the printing for the school department for the city of Newton. The work consisted of arithmetic and geography outlines, school manuals, graduating programs for the high school, catalog of text-books used in the city schools, letterheads, billheads, envelopes, etc.

"Printing may be handled from the standpoint of the public school shop. I believe the boy can be trained in the public school to follow the trade,—how successfully is for the future to determine. In any case, if the boys do not all actually work at the business, their training will be such as to increase their efficiency in commercial life."

SHEET METAL WORK.

Andrew J. Leahy, assistant instructor, in charge of the Sherwin Pre-Vocational Center, described the work to be done in that school:

"This class in sheet metalwork has not been organized, so that we have no knowledge as to its results at present. It is not intended to be a finishing class, but the idea is to give the boy an insight into the trade, the use of tools, the value of time, and render him more valuable on entering a trade school, or even a trade.

"Forty-five applicants are now on the list, but our plan is to have a class of thirty divided into two sections. Each section will receive ten hours per week of shopwork including the drawing. Boys of the sixth and seventh grades above the age of twelve are given the choice of electing the work with parental consent.

"The reasons for introducing this class are (1) Sheet metalwork is a constantly growing industry; (2) Its limitations at the present are not known.

"We cannot expect to teach one distinct branch as there are sub-divisions as follows;—cornice, and sky-light work, roofing, ventilation, blower work or dust collectors, tinsmithing, which is mostly shopwork in the working of tin, copper and brass in the making of culinary utensils; the metal trim, such as is being used on fire-proof buildings for door casings and all inside finishing, carpenters doing the fitting of the mouldings, but the sheet metal men, the soldering. It is only a question of time when the sheet metal men will do it all, as this question is now under discussion between the two organizations. To make buildings as nearly fireproof as possible the restrictions are rapidly increasing, hence the increasing use of sheetmetal.

"Regarding automobile work, the sheet metalworker, has not a little to do. In Detroit, twelve years ago, a very small sheet metal union existed, but since the centering of the automobile work there, it at present has a union of 2,800 men, which is as large as that of New York.

"Wages received: Ventilating and cornice men average $4.20 per day, while the tinsmiths average from $3.50 to $4.00, acording to the ability of the men and the kind of work done.

"The results expected are a number of things for school use as; handles for blackboard-rulers, water dishes for the painting lessons, lining of window boxes, drip pans for umbrella stands, ink fillers, and for the cooking class, scoops, measuring cups, doughnut cutters, baking pans, etc.

"The cost of the equipment is about $500, which will include duplicates of some of the hand machines.

"This will be the only elementary school this side of New York where this subject is taught and the school in New York is a distinct trade school."

CORRELATION, PRE-VOCATIONAL INSTRUCTION.

In discussing the correlation of the academic and industrial subjects in prevocational schools, Benj. H. VanOot, Instructor North Bennet St. Industrial School. said in part:

"The aim of the academic work in the pre-vocational classes of North Bennet Street Industrial School is fourfold; first, to develop self-governing young men thru the interlacing of the social and the industrial phases of the boys' lives; second, to parallel the curriculum of the public schools in-so-far as the subject matter emphasizes social and industrial efficiency; third, to emphasize individual advancement rather than class advancement, thus looking after the interests of the exceptionally capable boys as well as the laggards; and fourth, to direct the boys into channels where they can best develop their individual capabilities, whether those channels be the institutions of higher learning or the shops.

"In dealing with boys between the ages of thirteen and fifteen the teacher has to lay especial emphasis upon that in which the boys are interested. He has to place especial emphasis upon the pedagogical principles of proceeding from the concrete to the abstract, from the definite to the indefinite, and from what the boys know to what they never thought they would know. The subjects of most

interest to this class of boys are such as wharves, the markets, the current wars, the present strikes, points of historical interest in the immediate vicinity, base ball teams, etc. Having once interested a group (not necessarily a whole class) in some one of these subjects, it is a very easy task for the teacher to direct the organization and classification of the data that the class gathers, and to formulate lessons in formal arithmetic, language, geography, and history.

"The course of study in the North Bennet Street Industrial School comprises arithmetic, geography, grammar, English, orthography, history, elementary science, drawing, printing, and woodworking. These subjects are treated with an industrial and sociological aim in view. Problems of intense interest are formulated; sometimes from shop exercises, sometimes from the morning papers, sometimes from the taxes, rent, or insurance on the home of one of the members of the class. Geography is also based upon what the boys are immediately engaged in —the commercial districts, the steamship lines, the present industrial situation in Lawrence, Mass., and even the location and industrial relation of the cities forming the major baseball circuit. By a system of postal card exchange, and by exchanges of raw materials with other schools interested in similar lines of work, and by the collection of industrial exhibits of prominent manufacturers, we have been able to make geography appeal to the personal side of the boys and hence it is vastly more interesting. In English great strides have been made in the acquisition of a vocabulary and the comprehension of the meaning of English words by a comparative study of the root meanings of the Italian words (of Latin derivation) used in the homes of the boys and the English words of similar derivation used in the school and in business. In elementary science practical application is made of the simple machines, mechanics of liquids, heat and sound, and of simple principles in chemistry. Current events and standard boys' literature are used in the English work."

Mr. VanOot outlined in an interesting manner a type lesson on staining, preparatory to some work that was to be done in the shop. He also showed a map constructed by the members of a class showing the commercial districts of Boston, the steamship lines, warehouses, markets, and railroad stations. This map has an important significance in the comprehension of the industrial life of the community.

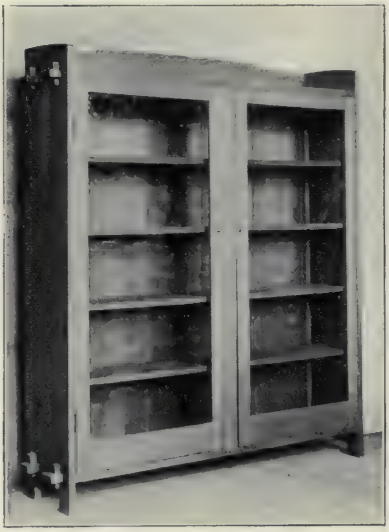
RICHARD BENSON.

SHOP PROBLEMS

George A. Seaton, Editor.

BOOK-CASE.

Both the photograph and the working drawing are shown of a book-case designed and constructed by a third year high school boy working under Phillip S. Hasty, Newman Manual Training School, New Orleans.



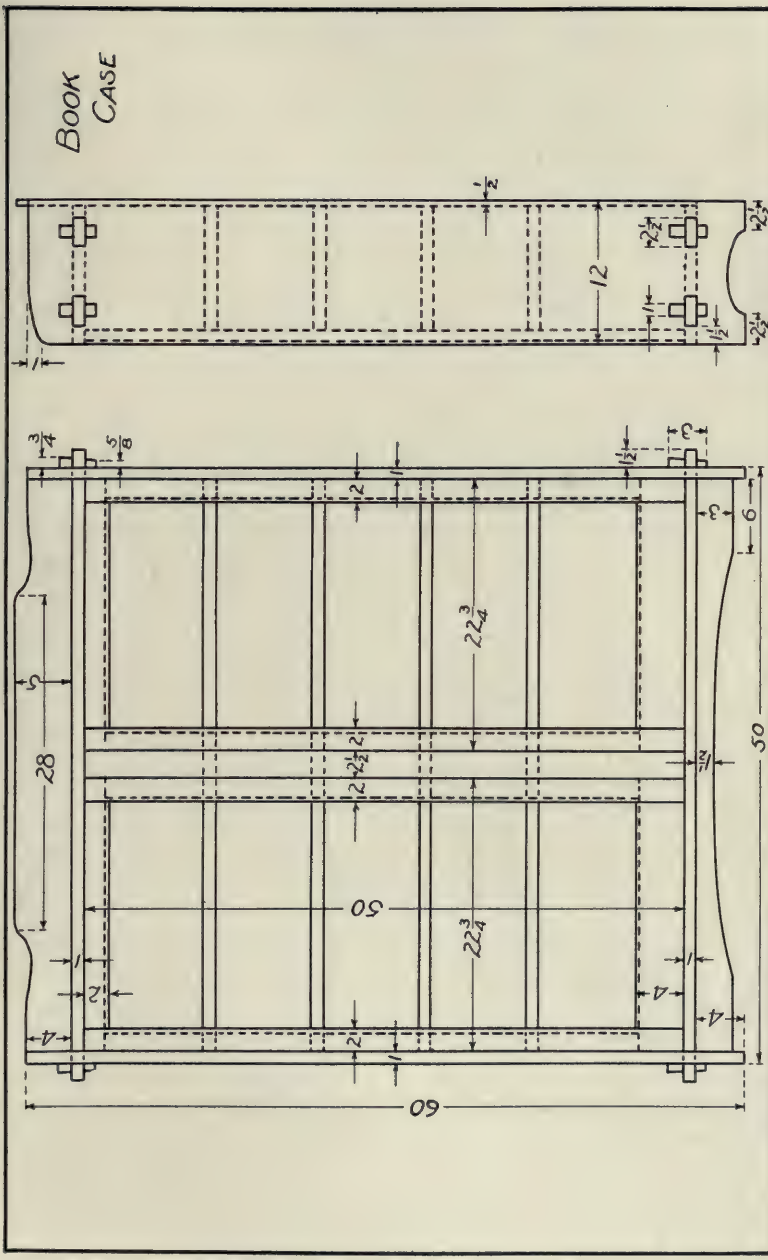
BOOK CASE.

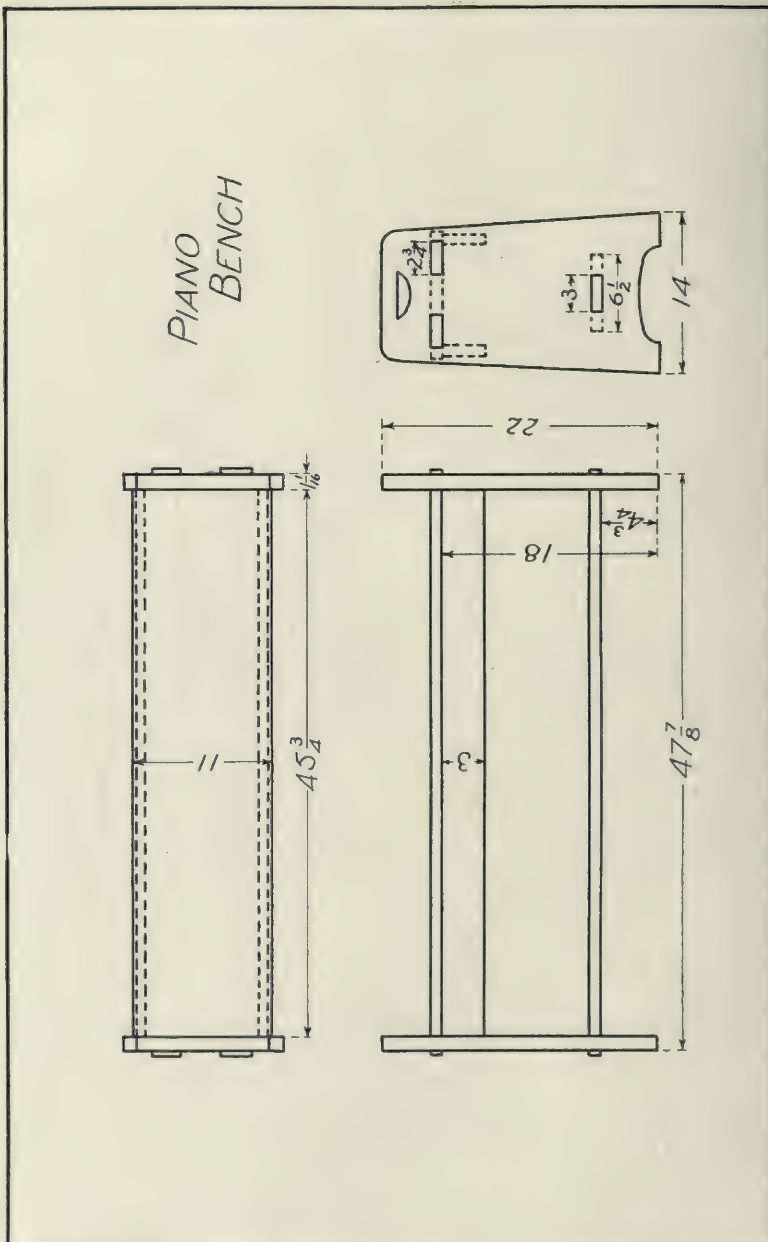
PIANO BENCH.

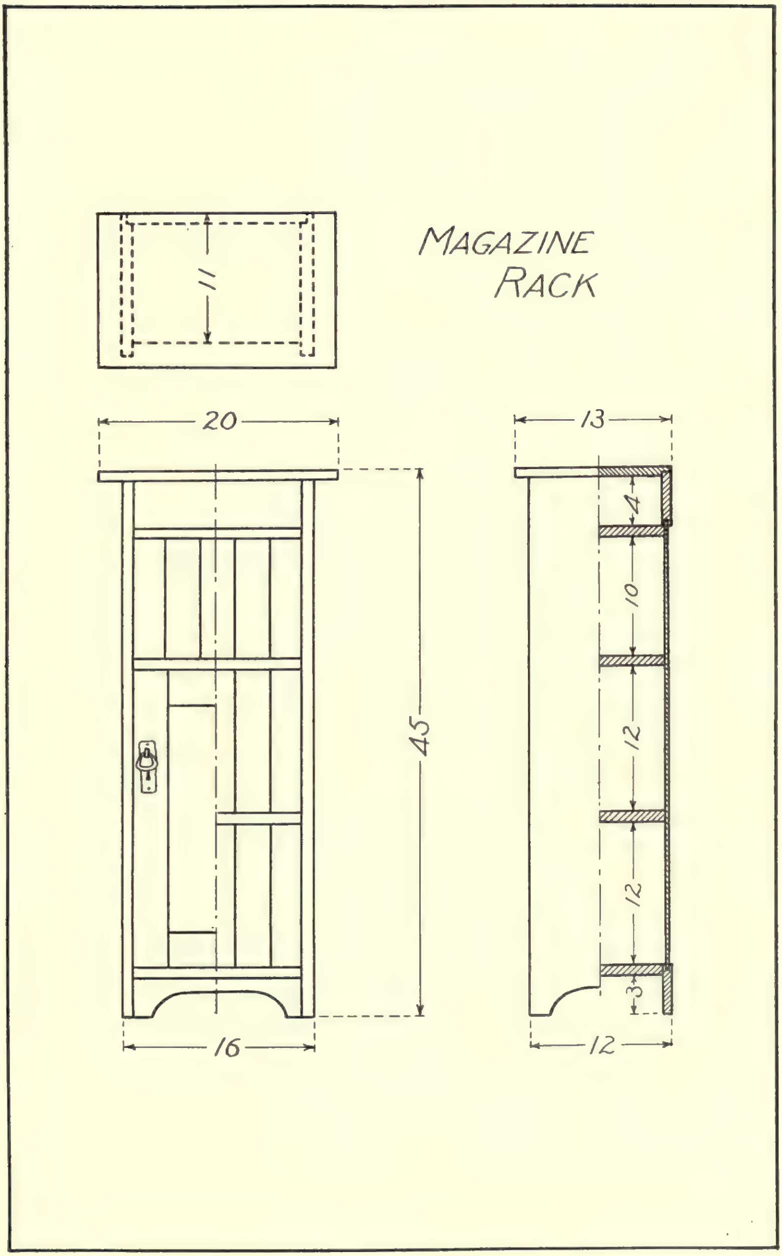
A problem in furniture construction which is comparatively simple, but not very often selected by students is that of a piano bench. W. E. Hackett of Reading, Pennsylvania, furnished the drawings for the one shown this month. For those who wish a bench providing space for storing music, a slight modification in the design might be undertaken. Instead of mortising the top thru the ends of the bench, the rails just beneath the top can be mortised in place. This will allow the top to be hinged in position so that the space between the rails, provided with a bottom, may be accessible for the storage of music.

MAGAZINE RACK.

The making of a magazine rack is a project frequently undertaken and the number of varying designs is great. Nevertheless, W. E. Hackett of Reading, Pennsylvania, has succeeded in producing the drawings for a rack quite different from the ordinary run, yet well-proportioned and splendidly adapted to its functions. A pocket and shelf are provided for the current magazines, while ample cupboard space is allowed for the older numbers. The addition of a door increases exceedingly the difficulty but adds so much to the appearance that it is surely worth while.

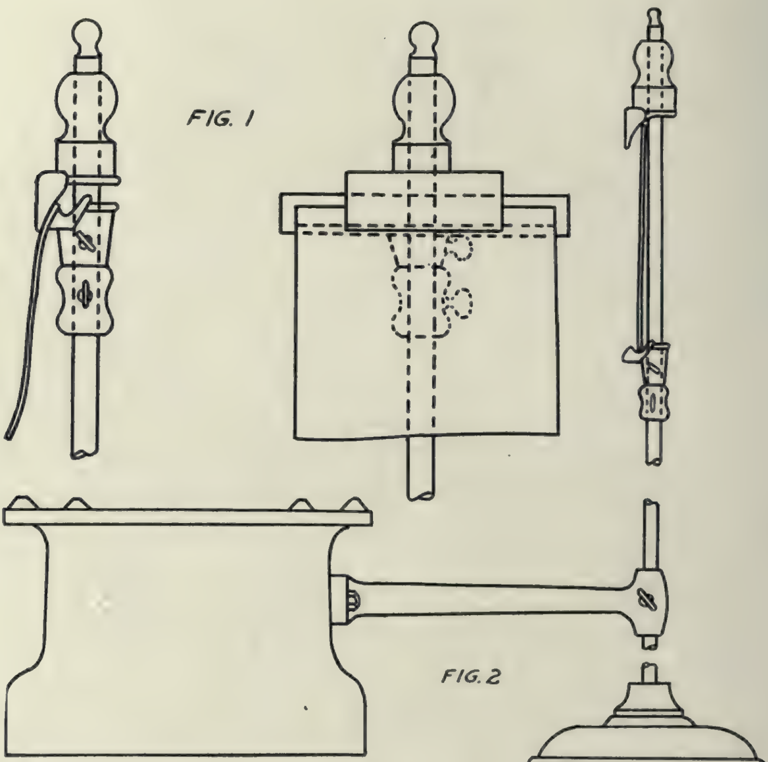

Book Case


PIANO BENCH
14
$2\frac{3}{4}$
3
$6\frac{1}{2}$
22
18
$4\frac{3}{4}$
$1\frac{1}{16}$
$45\frac{3}{4}$
11
3
$47\frac{7}{8}$


MAGAZINE
RACK
11
20
13
4
10
12
12
3
45
16
12

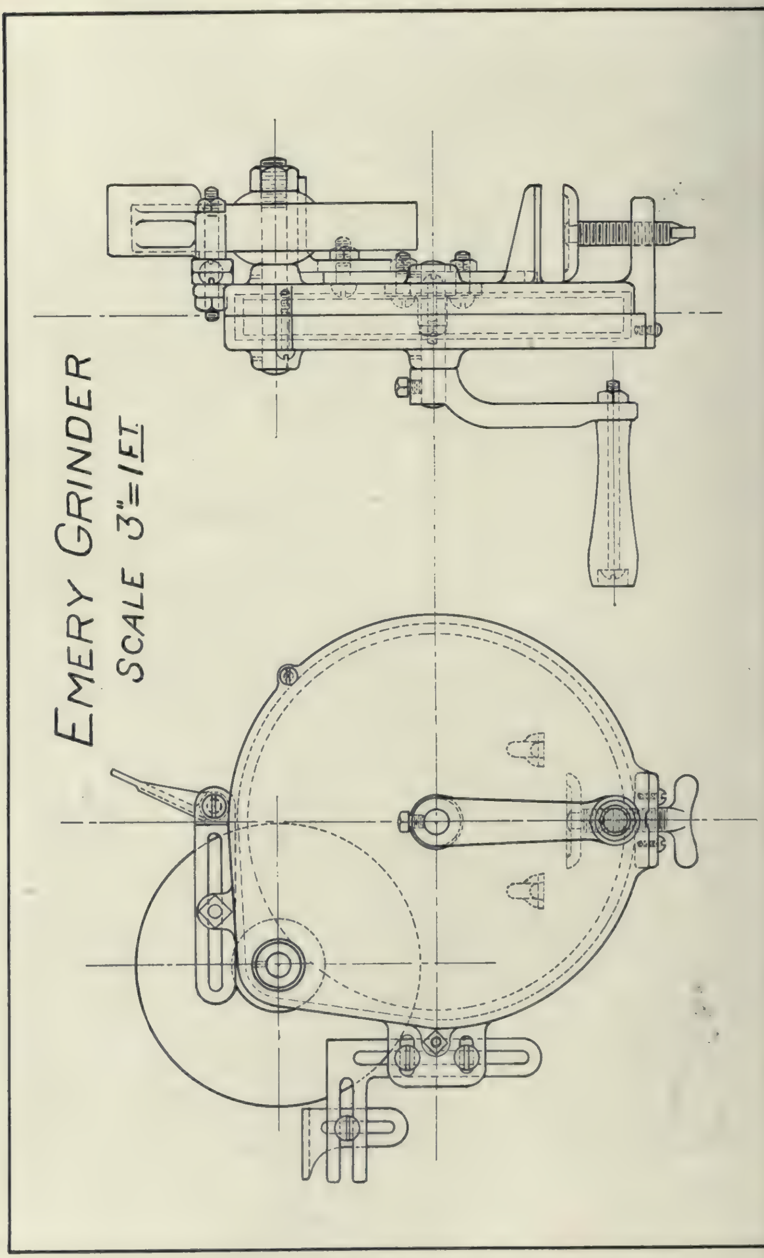
BLUEPRINT HOLDER.

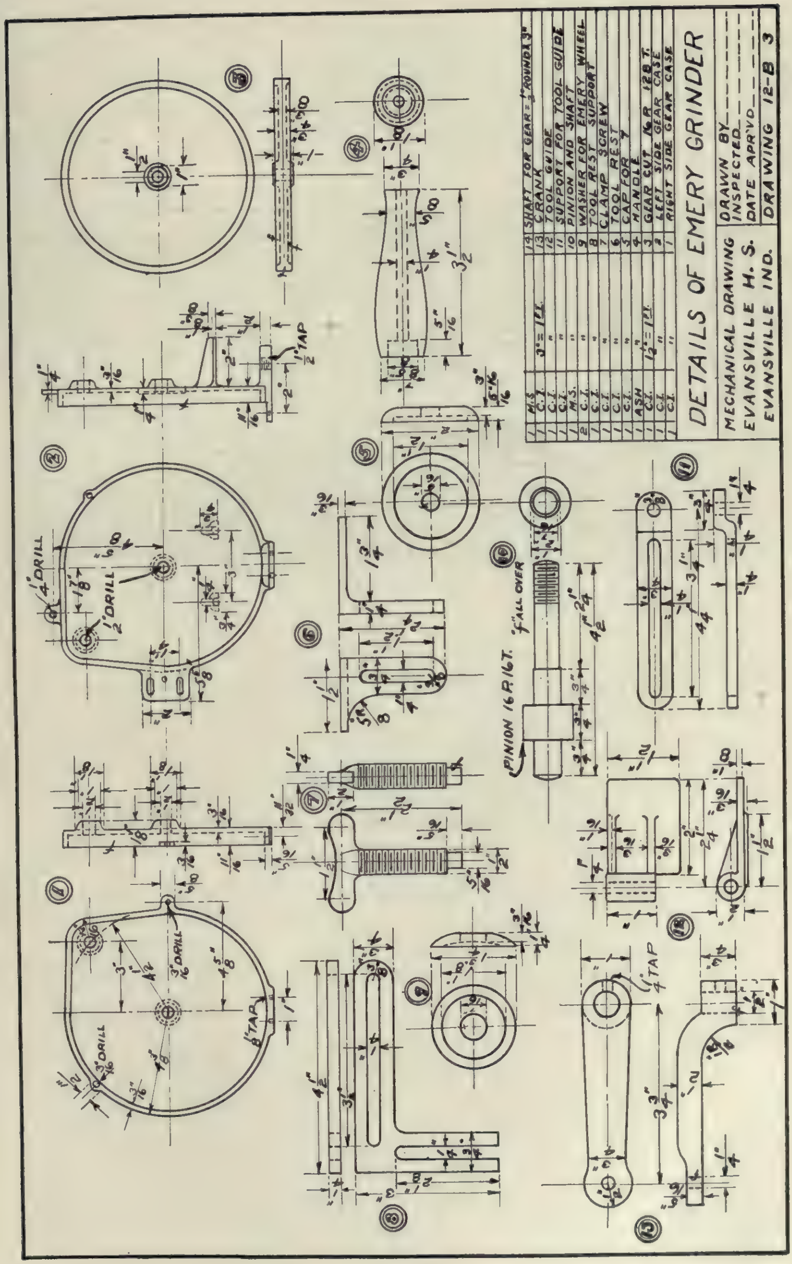
There is now in use in the Massachusetts Institute of Technology a convenient blueprint holder designed and patented by Robert H. Smith. As there are no springs or clips used in the holder, there is little chance for its getting out of order. The blueprint is held in place simply by the weight of the upper part of the



holder carried on the vertical rod. Fig. 1 in the sketch gives a front and side view of the holder with an unmounted blueprint in position. In Fig. 2 is shown how the two parts of the holder are separated to secure a mounted blueprint. In this figure is also shown the way the holder may be attached to a lathe or other machine and also a base which may be used when it is desired to place the holder on a horizontal surface. The photograph shows the holder carrying a mounted print and beneath the print a book carried in bookholder also devised by Mr. Smith.

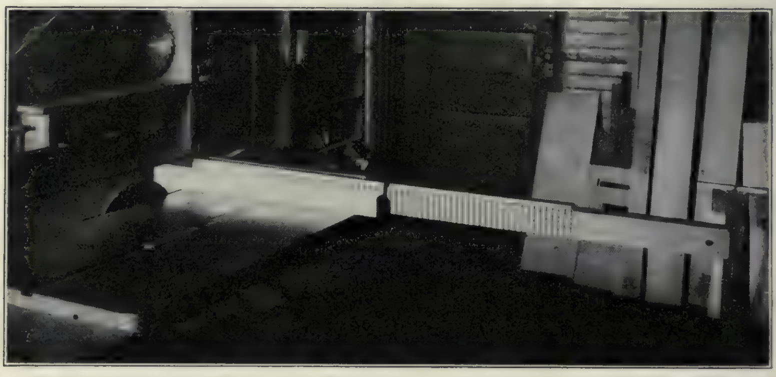
TEXT-BOOK HOLDER WITH TRANSPARENT CELLULOID COVER TO PROTECT OPEN BOOK, AND BLUEPRINT HOLDER HOLDING MOUNTED PRINT.


EMERY GRINDER
SCALE 3" = 1 FT


14 SHAFT FOR GEAR = 1/2" ROUND X 3" 1 M.S.
13 CRANK 1 C.I.
12 TOOL GUIDE 1 C.I.
11 SUPPORT FOR TOOL GUIDE 1 C.I.
10 PINION AND SHAFT 1 M.S.
9 WASHER FOR EMERY WHEEL 2 C.I.
8 TOOL REST SUPPORT 1 C.I.
7 CLAMP SCREW 1 C.I.
6 TOOL REST 1 C.I.
5 CAP FOR 7 1 C.I.
4 HANDLE 1 ASH
3 GEAR CUT 16 R. 128 T. 1 C.I.
2 LEFT SIDE GEAR CASE 1 C.I.
1 RIGHT SIDE GEAR CASE 1 C.I.
DETAILS OF EMERY GRINDER
MECHANICAL DRAWING
EVANSVILLE H. S.
EVANSVILLE IND.
DRAWN BY
INSPECTED
DATE APR'VD
DRAWING 12-B 3

CIRCULAR-SAW ATTACHMENT.

The photograph shows very clearly a convenient attachment for the circular-saw designed by E. H. Masters of Central Manual Training School, Cleveland. By its use a stop can be rapidly set to any length up to 36 inches, when it is desired to cut a large number of pieces of the same length. A strip of maple,



CIRCULAR SAW ATTACHMENT.

cherry, or other hard, close-grained wood forms the basis of the attachment. This strip is attached to the cross-cutting guide of the saw, and has upon its upper surface an ordinary maple yard stick. This is so placed that the dimension marks upon it come exactly opposite the saw cuts which are made upon the forward side of the strip. These cuts are made every half inch (or every quarter inch, if desired) and accomodate a metal stop which can be quickly dropped into any place desired. No dimensions are given, as the guard will vary in size according to the saw table upon which it must be used.

EMERY GRINDER.

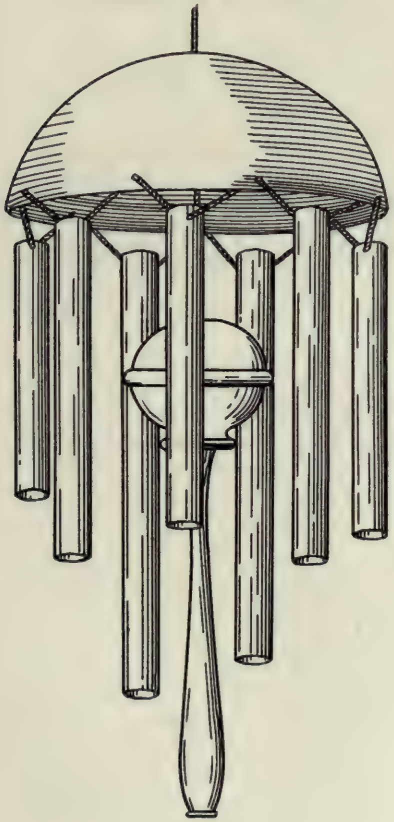
An excellent problem for the machine-shop has been submitted by Eugene C. Graham, director of manual training in Evansville, Indiana. The drawings from which the engravings were made were prepared by Ross Winship, instructor in the machine-shop. The design was worked out in the fourth year drawing class and later carried to completion in the shop. The assembly and detail drawings are sufficiently complete to make explanation unnecessary.

DINNER CHIME.

The idea for an interesting dinner chime has been sent in by D. K. Hiett, of the New York Millitary Acadamy at Cornwall-on-Hudson. The dome may be either spun or hammered from copper or brass, and should be about 3¾″ in

diameter. From this dome are suspended by cords pieces of thin brass tubing $\frac{5}{16}''$ or $\frac{3}{8}''$ in diameter and ranging from $3\frac{1}{2}''$ to $8''$ in length. If care is taken in selecting the proper lengths a very pleasant sound is given forth when they are struck in succession with the wooden hammer. In cutting the tubing into lengths, they should be a trifle long and then filed off until the proper note is obtained. The hammer should be turned from any hard wood with a head $1\frac{1}{4}''$ in diameter and suspended from the center of the dome by a cord.

DINNER CHIME



CURRENT ITEMS

GENERAL VIEW OF MANUAL TRAINING IN BOSTON, MASS.

The manual training influence begins with the first days in school for most children. Practically every one of the seventy school districts has one or more kindergartens. In the first grade no distinction is made between drawing and manual training, but the use of the rule, graduated to one inch, is encouraged, and paper cutting and folding is employed. In the second and third grades, one-half hour per week is devoted to a course of formal paper cutting and folding, with ruling and measuring to respectively one-half inch and one-quarter inch, special simple rules being provided. Instruction is given by the regular grade teacher.

Beginning with the fourth grade, the manual training of boys and girls, occupying two hours per week, differentiates, and thruout the remaining elementary grades the instruction in manual training for girls comes under the Department of Household Science and Arts, while the drawing and manual training, including pre-vocational instruction, are under the charge of the Department of Manual Arts. In the fourth grade, while the girls are occupied with sewing, under a special teacher, the boys take cardboard work under the regular teacher. The purpose of the work of this grade is to acquaint the pupils with plain lettering and the simplest conventions of the working drawing, to develop some accuracy in the use of the pencil, rule, triangle, compasses, and scissors, and to lead to the appreciation of a few fundamental principles of construction.

In the fifth grade, the girls continue the sewing while the boys take up, still under the regular teacher, a subject designated as Bookbinding, although including models which, strictly speaking, are not books. The work is of an elementary character, and logically follows the work in cardboard construction employing similar processes. It is expected to give some practice in making the simplest working drawings, to develop greater accuracy in the use of the rule, triangle, compasses, and scissors, to provide opportunity for some inventional work and for correlation with drawing in lettering and the application of design, and to give some experience in elementary bookbinding. To develop individual initiative and the ability to plan and to carry to completion simple constructive work is one of the most important aims of manual training, and the one most likely to be overlooked by the conscientious grade teacher. It is desired, therefore, that all models be presented as projects to be worked out by each pupil individually, and it is hoped that many classes will be able to attain satisfactory results, the teacher giving general rather than specific directions. In eleven of the schools in the city, attended by boys only, instruction in modeling is introduced from one to two hours per week in this grade under special instruction. As a common means of expression and description, correlating with arithmetic, geography, history, drawing and the sciences, modeling becomes an unconscious interpretation, in the hands of the child, normal or subnormal,

lacking so-called "talent." Construction of objects in three dimensions, pottery and tile work from original working drawings, nature work and designing, picture study, pose work, illustrative, imaginative and cast work perceptibly increase sensitive hand skill and appreciation of form in a short time.

Beginning with the sixth grade, the boys and girls alike go to specially prepared rooms for their manual training, under special instruction; the girls for cooking (one half year only, the other half year being devoted to sewing in the class room), and the boys for woodworking. The purpose of the work in this grade is to introduce the common woodworking tools with a limited amount of attention to technique, and to induce the pupils to use these tools freely. Some of the models require planning by the pupil, and are such as encourage freedom in the selection of tools and processes.

In the seventh grade the girls continue cooking and the boys their woodworking. The distinctive purpose of the work in this grade is to provide for a more thoro teaching of tool technique, and to furnish some definite opportunity for the practical application of constructive and decorative design.

During the eighth and last elementary grade, the girls take up dressmaking, under special instruction, while the boys continue woodworking. It is expected that the work of this grade will make demands on the pupils for greater originality, and for initiative in selecting and planning the projects. These projects should be such as require, during the last half year, more joinery or construction. It is obvious that no list of models can fully embody the foregoing principles. A course is presented, however, with the idea that the first half of it may be modified, while the complete course may be followed, thruout the year, by those pupils to whom, for any reason, the more desirable work cannot be given with good results.

Thruout the woodworking about one-tenth of the time of any pupils may be called upon for work for school purposes, making boxes, furniture, shelves, etc., and where such things are required in quantities it is desired that industrial or shop methods shall prevail for illustrative purposes.

Thruout the course, the Department of Manual Arts makes constant attempt to correlate the work in drawing and manual training under its direction. Much of this work depends upon occasional opportunity and the ability of the teacher, but at least once a year a definite problem is attempted, and a material result is required, based on specific work laid out in drawing and manual training.

Boston has one Industrial School for Boys and a Trade School for Girls, which will be found treated by Professor Leavitt in a current number of "Vocational Education."

Pre-Vocational Education as conducted in Boston is fully described in the report of the March meeting of the B. M. T. C.—which appears in this number.

Of the fifteen high schools, seven are fitted up for manual training for boys, and another will doubtless be fitted up this summer. The Mechanic Arts High School has a very complete equipment for the usual lines of work conducted in such schools, and the High School of Practical Arts has strong courses in domestic arts for girls. Many high school drawing teachers illustrate their courses of design with applications to material such as brass, copper, textiles,

and leather. Manual training is elective thruout the high school years, and students may devote from two to ten periods per week to it. Woodworking forms the basic subject of instruction, and art metal work is a common subject for the advanced pupils. One high school does strong work in electrical construction with ship drafting; another specializes on jewelry design and construction.

The Normal School provides manual instruction only for the elementary lines to be taught by the grade teachers, such as cardboard construction and bookbinding, there being in this city the fine Sloyd Training School from which many of the manual training teachers are recruited.

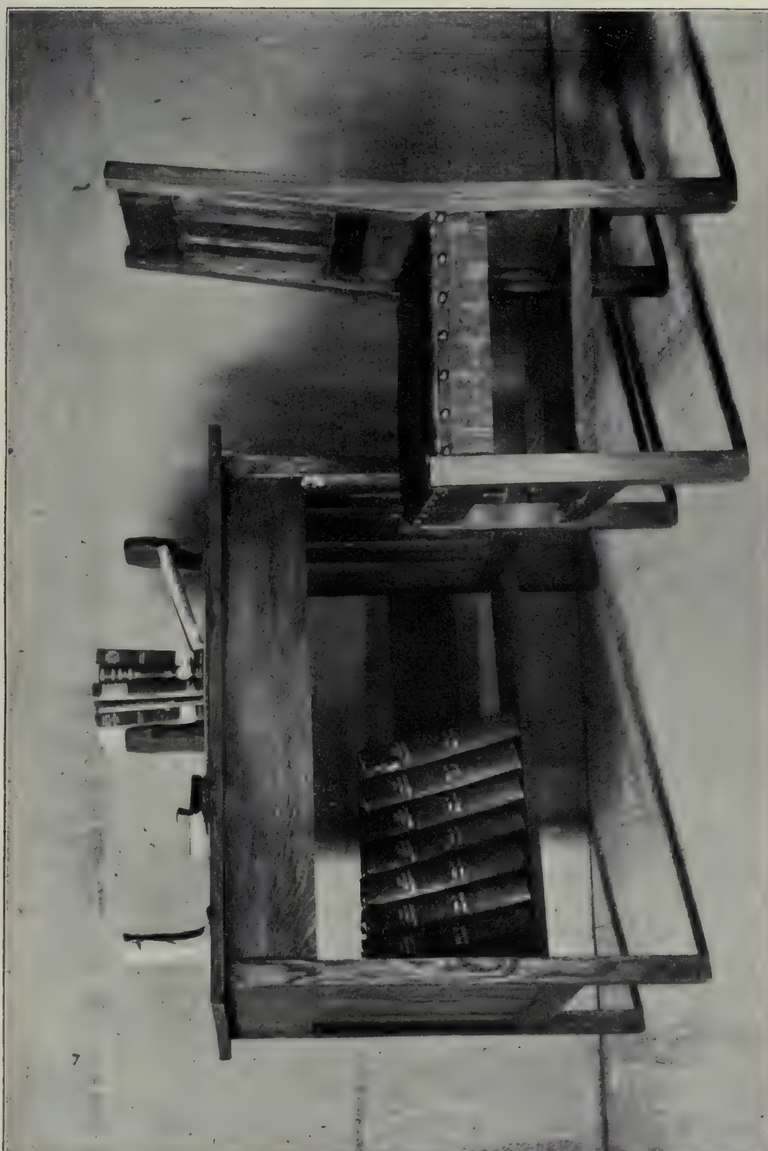
The administration of manual training, together with drawing, in the city devolves upon the Department of Manual Arts consisting of a Director, Mr. Theodore M. Dillaway, an art expert, an Assistant Director, Mr. John C. Brodhead, who administers the manual training, an Instructor, Mr. Edward C. Emerson, who looks after the woodworking in particular, and seven assistants, one of whom, Miss Florence O. Bean, supervises the elementary manual training taught by the grade teachers.

RURAL SCHOOL MANUAL TRAINING.

Rural school work in general has received much attention in the past year and the value of the manual arts in furthering the interests of the rural schools has been increasingly recognized. Obviously each country school cannot afford to employ a specialist in manual training and therefore the scheme of cooperative rural school manual training devised by Clinton S. Van Deusen is of renewed interest. This cooperative plan was described in the April, 1911, number of the MANUAL TRAINING MAGAZINE, since which time Mr. Van Deusen has developed the plan still further. It has also been presented at various educational meetings in Illinois.

The plan is this: A populous county may be divided into cooperative districts, each district representing the field covered by one trained director of manual training. This director visits 25 one-room rural schools (or the equivalent of this number) once each week, an average of five schools a day, five days in the week. The pupils work three hours a week, using typewritten instructions left by the director. In some larger schools the director stays a longer time, but the minimum time for any school is one-fifth of a day. Some schools, having only one or two boys taking the work, send them to a near-by school where the director spends a longer time. All of the schools in each manual training district combine in paying the expenses and salary of the director. This brings the expense down to a very small amount for each school.

Of course, securing the cooperation of these rural schools is the difficulty. A definite plan for securing this cooperation is being evolved in connection with the experiment conducted by Mr. Van Deusen, with Bradley Institute as a base of operation. A senior student in manual arts serves as director. The county superintendent was first interested, and he in turn has enlisted the active interest of a group of teachers in the county. These people, tho not formally organized, really serve as a committee of propaganda. They aim to secure proof of the



CHAIR AND TABLE. THIRD YEAR HIGH SCHOOL. NEWMAN MANUAL TRAINING SCHOOL, NEW ORLEANS, LA.

feasibility of the plan to present to other schools not interested. If this group of people can circulate a report of the success of the plan from the two schools where it is now being carried on effectively (this report bearing the endorsement of the county superintendent), and if they can get the board of supervisors to pay one day's wages of one of the manual training directors to act as county director, an entering wedge has been well placed. Then each school district can be visited with blanks indicating the cost for each school in the group, and with blank contracts. Every school added to the cooperative group adds weight to the force of the argument presented by the county committee.

This cooperative plan is sometimes confused with the cöoperative plan between small towns with an itinerant director of manual training. Both plans promise much for the advancement of manual training and should receive the careful consideration of school men the country over.

JERSEY CITY'S TECHNICAL HIGH SCHOOL.

Jersey City, New Jersey, has a new technical high school which will soon be ready for occupancy. It is a part of the general high school newly erected a few years ago. The new extension cost about $500,000 and the cost of equipment will amount to $150,000 more. The high school stands on a fine eminence overlooking the city and New York. The technical school has four wood-working shops, a forge-shop, a foundry, a machine-shop, an elementary machine-shop, four mechanical drawing rooms, a print shop, and three electrical and steam laboratories.

A continuous session is planned which will last from the time school opens in the morning until after the evening session at night. The time between the regular day session and the evening session will be filled with continuation classes, made up of young people from the industrial plants of the city. The principal, Frank E. Mathewson, hopes to induce the employers to release a large number of the younger workers between four and five in the afternoon. If the young people can be so released, they will be able to get a supper at the school at a nominal cost, have a two-hour period in instruction, and still get home early in the evening.

The course of study for boys is so arranged that for the first two years the time will be almost equally divided between shopwork and academic subjects. Specialization will be allowed during the last two years altho a certain amount of academic work will be part of the courses elected by the individual students.

MANUAL TRAINING IN MAINE.

The encouragement given to the development of manual training in Maine by the state-aid laws of 1911, lends interest to the history of the growth of the subject in that state.

The subject was first introduced in the city of Portland in 1893, at which time two schools were equipped with thirty benches each. This beginning was made possible by the generosity of the mayor, James P. Baxter. In 1901 the Walker manual training school was dedicated. This school was the result of a gift of $20,000 from Joseph Walker. The first building in Maine devoted

exclusively to manual training, however, was the Warren Manual Training School at Cumberland Mills, opened in 1895. A third manual training school was opened at Lewiston, in 1897. The subject was introduced into the Bath public schools in 1901. A legacy of $78,000 from Miss Lucinda Bailey is available in Bath for an industrial training school. Since that time the schools having manual training departments have increased rapidly until now twenty-five towns have such departments and eighteen have domestic science also.

TROUBLE AT NAAS.

Since the death of Herr Otto Solomon, the institution at Naas, which has had such a beneficial effect on manual training the world over, appears to be passing thru troubled waters. When the state in Sweden took over the institution the first step was the appointment of a body of five trustees, whose first business was the appointment of a director. As no application reached them which seemed desirable they have been compelled to appoint temporary directors. It was hoped that one of these would prove the man for the place and would be willing to accept permanent appointment. This hope has not been fulfilled so the trustees resigned in a body but the king has refused to accept the resignations. Things are thus at a standstill. Whether the terms of the will, or the means of the institution, or the trustees, themselves, are at fault cannot be ascertained. It is probable that expert counsel will be called in in the person of Herr Lindström, late minister for church and school.

MINNESOTA.

An interesting development is reported from one of the thirty Minnesota high schools in which instruction in domestic science, manual training, and agriculture is receiving generous financial encouragement from the state under the provisions of the Putnam Act. One of the requirements made by the State High School Board is that all schools benefiting under this Act shall maintain a short course of twelve weeks during the winter, outlined with particular reference to the boys and girls from the surrounding agricultural districts. The work in these short courses, both handwork and bookwork, is given strong industrial significance with respect to agriculture.

Knowing these circumstances, one might expect to see the boys in the manual training shops of these schools at work on projects useful on the farm. However, in the case reported, the hay-racks, wagon boxes, hog-racks, and milk-stools which might be looked for are not in evidence. Instead are library tables, taborets, Morris chairs, and writing desks. The boys were given an opportunity of making articles of farm interest. They insisted that if they could learn to make a bookcase or chair, the construction of which involves nice manipulation of tools and a large variety of tool processes, then a hay-rack, "which can be thrown together with saw and hammer—without even a square, if necessary, would not bother them very long."

In this, two facts seem significant: first, that an inclination was manifested to produce something in which beauty of design and individual taste play a

SEWING AND EMBROIDERY FROM GRAMMAR GRADES AND HIGH SCHOOL—PUBLIC SCHOOLS, YPSILANTI, MICHIGAN.

part; second, that these boys, earnest in their work, desired not so much to produce *something* as to acquire a knowledge of the use of tools in the limited time at their disposal. Whether or not the same observation could be made in the case of less mature and serious pupils is open to question.

A MODEL SCHOOL FOR TORREYTOWN.

During the sessions of the Convention of Department of Superintendence, National Educational Association, which met recently in St. Louis, the interest of many of the hundreds of delegates was aroused over the call for plans for a model school to be established in the ideally planned village of Torreytown, Howell County, Missouri.

Fuller Swift, a delegate to the convention and representing Col. Jay L. Torrey, of the Fruitville Farms and the village of Torreytown, offered a prize of one hundred dollars for the best set of plans of the architecture, course of instruction, and organization of the proposed model school. The plans will be submitted to a committee of members of the National Education Association, including some of the leading workers of this state most interested in rural school work and this committee will pass upon the plans and award the prize.

The result of this movement started by Col. Torrey will be so far reaching that it will be difficult to estimate its benefits. It means that the leading educators of the country will be attracted to Missouri and its school work.

It is a fact becoming generally recognized among those interested in country life, that the country schools are not doing the class of work best adapted to interest the boys and girls in the advantages of country life. With this in mind Mr. Swift requires that the plans for this model school shall be directly pointed toward any and everything best calculated to deepen appreciation of life in the country and to counteract the too general trend from the country to the already over-crowded cities.

Col. Torrey is not only interested in the development of the Fruitville Farms and the construction of the ideal village named for him, but as president of the Missouri Immigration Society, is desirous of having Missouri present to the nation, not only the model country school, but the model village school, which will be located in Torreytown, where will be found other ideal conditions of country life under the Torrey Plan of Country Life for Profit and Pleasure.

Once this model school is established and in operation with domestic science, manual arts, horticultural and agricultural departments and with its school garden and orchard it is not unlikely that the interest and pride of its patrons will contribute largely to its maintenance.

It goes without saying that the thinking man and woman of today want not only a home where can be found the means of making money, but conditions favorable to the highest development of the youth of the community.

Waco, Texas, has a new up-to-date $150,000 high school in which manual training and domestic economy are well provided for. The supervisor of manual training, L. R. Stanfield, proved his practical ability in planning the building

and equipment and in overseeing the details of construction. The building is of reinforced concrete, metal lath, and plaster, fire-proof thruout. It is equipped with the "Boston plan" of artificial electric illumination. Provision has been made for use of the building for night classes and as a social center. The manual training department has three large rooms with adjacent storerooms in the new building. The cabinet shop is equipped with individual benches, a 36-inch band-saw, universal saw-bench, a 24-inch single surfacer, and a 12-inch jointer, in addition to the usual equipment of tools. The cabinet room equipment represents an expense of $3,400. The pattern-making shop equipment cost $2,400. The lathes and all machinery in both shops are run by the unit system of electric motors. The third room is equipped for mechanical drawing. Complete sets of instruments for this work are furnished to the students free. Iron work will be provided for later, the building being so arranged that an addition will be possible in a short time.

The domestic science department has a cooking-laboratory with complete equipment, and a model kitchen and dining-room, with a roomy storeroom. The supervisor's office serves as the living room of the suite. There is also a sewing-room with an adjoining fitting room.

By the beginning of the next school year it is hoped that plans will be perfected so that the work for both boys and girls can be given a coordinate place with other subjects thru all grades and the high school. The work was introduced into the colored schools this year.

The liberal expenditure of funds in providing for the manual arts in this city would seem to indicate an appreciation of their true value in education, since the proper working out of a successful manual training system requires large expenditures.

The Polytechnic High School of Santa Monica, California, now offers an additional or thirteenth year of work, the new courses being mechanical, civil, electrical, and chemical engineering, mining engineering, architecture, commerce, art, domestic economy, analytical and industrial chemistry. The new classes were opened for registration February second. The art course includes instruction in the usual lines of art school work, and also vocational subjects such as lettering for show cards and signs, pottery making, metalwork, jewelry, weaving, costume design, and a study of textiles. The courses in domestic economy are intended for girls who expect to become teachers of household arts, or to prepare for household or institutional management, dietetics, sanitation, or for social work, secretaryships, or special work in chemistry and bacteriology.

Provision has been made for continued work in such regular high school subjects as are closely allied to these courses.

These advanced courses are open not only to graduates of the Polytechnic high school but to all applicants who have had sufficient training to make it possible for them to take the advanced work.

Santa Monica will have a new high school, consisting of a group of three buildings, ready by the 1st of next August. A distinctive manual arts course will be offered next year.

REVIEWS

All the Children of All the People. By William Hawley Smith. The Macmillan Company, New York, 1912. 5 x 7¼ in.; 346 pages. Price $1.50.

There are books on education that are so full of the technical terms of the laboratory that the ordinarily intelligent reader needs a special lexicon at his side as he labors thru them. There are others that are free from such "pedagogic jargon," but lack clearness and force of style. There are a few, however, that are so attractive in style, so clear in statement, and so true to common experience that the reader is held from chapter to chapter and regrets when the end is reached. Standing high among such books is this latest book by Mr. Smith. It is the result of many years of observation and thought upon the problems of democratic education, and especially upon the nature of the child to be educated. Tho his general theme is not entirely a new one it is presented in a decidedly new way. It gives the facts disclosed by science in such a simple style that any reader may readily comprehend them.

Mr. Smith is known to most people as a humorist, and a teller of good stories and plain truths; in this book on education he makes just the same refreshing appeal to common sense, fair play, human sympathy and justice between human kind. From cover to cover the book is full of incidents that are so strikingly appropriate that they are sure to be repeated over and over again, carrying with them the author's message of human uplift. Mr. Smith believes that some children are "born short" with reference to certain studies, while other children are "born long." He believes that children should be treated as individuals and not *en masse;* that many so-called mental defects are really physical obstructions; and that handwork is a valuable factor in education.

All the Children of All the People is a remarkably stimulating book—a book that will do a great service to education. —C. A. Bennett.

Handwork as an Educational Medium. By P. B. Ballard, M. A. Swan, Sonnenschein, and Co. Lim., London. 5¼x7½ in.; pp. 194. Price 90 cents.

This essay, by an English psychologist, is a very clear and interesting presentation of the psycho-physiological aspects of handwork. It introduces no new theory but is a commendable effort to extract the kernel of truth from various theories, past and present. Much of the argument is in harmony with the well-known ideas of William James, who is frequently referred to in the essay. American readers, therefore, will find a familiar starting-point in following the author's line of thought. The essay is free from those technicalities and endless comparative statistics which, for the average reader, detract so much from the interest of psychologic treatises.

The blind enthusiasm of the handwork faddists is sketched with a light but sure touch, which reveals the humor latent in the position of the extremist. Between the free expressional work of the primary grades and the technical

work of the upper grades lies the field in which these faddists try out their various schemes. Mr. Ballard would have us select and use the good from all these forms of handwork instead of pushing the use of any one form to that point where execution becomes automatic and hence loses its developmental value. The chapter devoted to this intermediate department is very valuable, especially as a means of reducing to some degree of order, the existing confusion in this realm of school work.

The latter half of the book treats a different, but equally stimulating topic, "The Fundamental School Subjects." Teachers in general will profit from reading these essays, which deal with a live subject in such a sane, bright, and convincing way. V. E. WITHEY.

Booklet Making. By Henry Turner Bailey. The Prang Company. 5½x8½ in.; pp. 48. Price 75 cents.

Made intelligently, a booklet is, as Mr. Bailey points out, an excellent problem for all grades of school work; it furnishes an unusually good means of correlation; and is, withal, a delight to the maker. Too frequently in the past, however, teachers have considered, in booklet-making, the subject matter and neatness of execution only, and have ignored the fact that, above all else, a booklet is a problem in design. One shudders at the memory of the painfully neat but hopelessly inartistic results. With this book of Mr. Bailey's as a guide, every teacher in the United States should be able to secure well designed, well composed booklets which represent the pupils' best in every part.

The book presents the subject in simple language and in carefully outlined steps from the inception of the idea to the disposal of the product. The various steps are fully illustrated.

This book has that personal touch which the author's pleasing, informal style adds to all he writes. —V. E. WITHEY.

Illustrated Exercises in Design. By Elizabeth Garrabrant Branch. The Prang Company. 11x7¼ in.; pp. 84. Price $1.50.

This new book on design by a teacher of experience will be sure to find for itself a permanent place in the art teacher's working library. It consists mainly of plates, each illustrating some principle or phase of design, accompanied by a few words of explanation. At the front of the book, preceding the plates, are given more complete explanations of the value of each exercise, for the purpose of assisting the teacher. The illustrations are large and simple, the pencil and wash rendering of the original drawings having been unusually well reproduced. They are just the sort of pictures which teachers are glad to show their pupils in giving them inspiration and suggestions for their work. A book on this subject is sure to meet with criticism for the reason that all are not agreed as yet, as to what constitutes good design but we venture to predict that, with the exception of a few of the plates on decorative composition, the book will meet with much praise from the teacher of art in the grammar grades and high school. Manual training teachers also will find the exercises very helpful. The book has a great advantage in that the size of the pictures, the

wide marginal spacing, and the clear-cut quality of the illustrations make it possible to show the examples to a large group of students at the same time.

—V. E. WITHEY.

Cabinet Making. A manual for high school students by Fred C. Whitcomb. Bulletin No. 4, Series X, published by Miami University, Oxford, Ohio. Price 25 cents.

This fifty-page bulletin is another distinct contribution to the effort being made in the Central States to enrich and standardize courses in the manual arts, and to place them on as high a plane as any group of subjects in the school curriculum. The manual arts courses of the future will not be merely exercises in tool work but they will be problems rich in subject matter. In line with this idea Mr. Whitcomb's course, as stated in his preface, stands for the following:

a—It outlines a broad study of one of the larger and more important woodworking industries.

b—The construction work is made the foundation of the course, theory, design, working drawing, and shop mathematics all growing out of the needs of construction, as they do in the industrial world.

c—The order of procedure in each problem is as follows:

1—Development of the special subject at hand or demonstration of the process.

2—The reading of references along the line of "1."

3—The "doing."

4—Discussion of the "why," nature of tools used, etc.

5—The solving of problems in shop mathematics related to the special process at hand or concerned with the material used.

d—A stock bill and time schedule are required for each piece of furniture constructed in order to relate more closely the work of the school to that of the shop, where the economic phase of the problem must always count.

e—The whole class is to work together on most of the processes to give more opportunity for class demonstration and for closer supervision of every step of the work by the teacher; but plenty of room for individual initiative and expression is afforded in the variation from a set model. For instance, one of the pieces of furniture to be constructed is a table, in which the height is the only definite dimension, and numerous styles and forms are possible. Also, another problem is the construction of a cabinet, which may assume any one of a large number of different forms.

The Essentials of Lettering. By Thomas E. French and Robert Meiklejohn. McGraw-Hill Book Company, 1912. 9x6¼ in.; pp. 94. Price $1.00.

This is the third edition of this thoroly commendable book on lettering. It has been revised and enlarged by twenty-two pages. The text and illustrations have been rearranged so as to produce a more artistic piece of book-making. The chapters on "Design and Composition," and "Monograms and Ciphers" are especially improved. The book retains its original form. As it is now we fail to see what more could be done within the limits of its title to make this the ideal book on lettering for both artists and draftsmen.

RECEIVED.

Eastern Art and Manual Training Teachers' Association. Proceedings of meetings held in Boston in 1910 and in Philadelphia in 1911. Fred H. Daniels, Editor, Newtonville, Mass. Contains addresses by Arthur D. Dean, J. F. P. Lawton, Denman W. Ross, Cheesman A. Herrick, Walter Sargent, Leslie W. Miller, William McAndrew, Anna C. Hedges, Frank A. Parsons, Alvin E. Dodd and others, also a list of the members of the Association.

Sloyd Record. Sloyd Training School, 7 Harcourt Street, Boston, Mass. The March number, consisting of fifteen single sheets of working drawings and half-tone illustrations of problems intended to meet the needs of the individual boy.

Course in the Use and Preparation of Vegetable Foods. By Anna Barrows. A 98-page bulletin issued from the office of experiment stations of the U. S. Department of Agriculture, Washington, D. C.

A Course in Household Arts. In two parts, A. and B. By Ellen L. Duff, principal of public schools of cookery, Boston, Mass. This is essentially a text-book for use in the public schools.

Report of Public Schools of Cincinnati, Ohio, 1911. F. B. Dyer, Supt. Gives considerable space to the work of the continuation schools, elementary industrial schools, vocational guidance, manual training and domestic science.

Concrete Construction on the Live Stock Farm. Farmers' Bulletin 481, prepared under the direction of the Bureau of Animal Industry, U. S. Department of Agriculture, Washington, D. C.

Wisconsin Arbor and Bird Day Annual, 1912. By O. S. Rice. Published by the State Department of Education, Madison, Wisconsin. This is a volume of 148 pages, and is well illustrated. It contains an extended article on the birds of Wisconsin, an article on "Economy in the Use of Wood" and devotes considerable space to the prevention of forest fires.

Report of the Lake Mohonk Conference, 1911. Henry S. Haskins, Mohonk Lake, N. Y. Contains some valuable papers on education in The Philippines and Porto Rico. One of these deals with industrial education in the Philippines.

Athletic Handbook. For the Philippine public schools. Frank R. White, Director of Education, Manila. An illustrated book of 96 pages.

Report of Public Schools, Utica, N. Y., 1910-1911. Wilbar B. Sprague, Supt. Contains report of the department of manual arts.

Catalog of Hebrew Technical Institute, 34-36 Stuyvesant St. New York City. Edgar S. Barney, Principal.

Arbor Day Annual, 1912. *Fruit Trees of New York,* New York State Education Department. Compiled by George Martin Wiley. A finely illustrated pamphlet containing much valuable information for agriculturists and teachers.

Th Kingdom of Dust. By J. Gordon Ogden. Popular Machanics Company, Chicago. Price, 50 cents.

The Dying Hickory Trees: Cause and Remedy. By A. D. Hopkins. Bureau of Entomology circular No. 144, U. S. Department of Agriculture, Washington, D. C.

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